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The 2002 Quality Management Week & 14th Annual Quality Management Conference is scheduled February 25 through March 1, at the Hyatt Regency in New Orleans.

Use a Balanced Scorecard to Implement Strategy

By Dr. John Lingle and Dr. Nancy Nygreen

The "balanced scorecard" is a strategy implementation tool initially proposed by Robert Kaplan and David Norton of the Harvard Business School (*Harvard Business Review*, Jan-Feb 1992). It calls for a set of measures that are carefully balanced according to a variety of criteria (unique and generic, leading and lagging, short- and long-term, hard and soft, financial and non-financial), that are used to help align an organization around its strategy, to test the strategic assumptions, and to monitor progress in strategy implementation.

The airplane cockpit is a useful analogy for explaining the balanced scorecard. The pilot, the senior leader, controls implementation of the airplane's strategy (to land at the right airport at the right time and safely) by monitoring a set of related gauges: heading, air speed, altitude and attitude. A pilot who monitors only one measure (air speed, or financials) will not implement the strategy successfully. A pilot who fails to understand the interrelationships (raising the plane's attitude without adjusting air speed) may cause the plane to stall and crash.

Visualize an airplane simulator that is used to train pilots. In this changing environment, the pilot must constantly scan the key gauges and make adjustments in response to changing weather conditions. A pilot who adjusts one key measure (the heading) without taking other indicators into account (wind direction and air

speed), may land at the wrong airport and fail to achieve the strategic objective. Organizations need a similar set of large, easily visible gauges to let them know whether they are on track in implementing their strategy.

Five factors in the airplane analogy are important for understanding the power of a strategic measurement system using the balanced scorecard approach:

Senior leadership must start by understanding and agreeing with the concept of a measurement-managed organization.

- First, senior leadership is forced to agree on the details of the strategy because they must be defined in a measurement language.
- Second, the strategy drives all elements of the measurement plan (What airspeed? What heading?). Linking all measures to the strategy creates alignment; all parts of the system focus on achieving the same result.
- Third, everyone understands that an adjustment to one indicator may have an impact

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JONES AWARD WINNERS

During the Quality Management Conference in February, winners of the Howard Jones Award were recognized. Chosen for long-term leadership and excellence, winners of this award are, from left to right, Jack Campanella, Roger Berger and Josh Tye.



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A New Year and a New Team

Grace L. Duffy

Welcome to a new year of *The Quality Management Forum*. This is the fifth issue with a new look and format. We have received good feedback on the *Forum* upgrades as well as on the changes to the Quality Management Division (QMD) website.

This is the beginning of a new American Society for Quality (ASQ) year. The picture accompanying this column has changed. No, Jack Moran did not grow his hair longer. I am Grace Duffy, the incoming QMD chair. I look forward to serving you for the next two years. Jack did an overwhelmingly good job leading the division since 1999. His shoes will be hard to fill. Fortunately, as past chair, he will continue to provide his excellent guidance to the QMD leadership committees. Well done, Jack.

New team members

QMD has several new leadership team members. Patty Westfall, current Quality Manager Certification chair, is our new vice chair of human resources. Wendy Lambert replaces Patty as the Quality Manager Exam chair. Ron Bane, previous vice chair of regional activities, takes over as QMD treasurer, replacing John Bauer, now chair elect. Marc Clarke is vice chair for regional activities. We are searching for a replacement for outgoing vice chair of marketing and communication, Dan Stowell. Dan has done a phenomenal job aligning our written and electronic identities. We wish him all the best with his next challenges.

Check out the organization chart on our website, www.ASQ-QMD.org, for more growth and movement within divisional leadership ranks. Some of you who have volunteered recently are now serving as article reviewers, certification exam developers, speakers and quality management systems contacts.

An addition to QMD is H. Fred Walker, Ph.D., the new publications chair and *Forum* editor. Fred was the editor of the special *Forum* issue, "Quality and the Bottom Line," which continues to sell additional copies through ASQ. Fred is doing good work in continuously improving the *Forum*.

Last year was a very good one for the division. In 2000, QMD published the second edition of the *Certified Quality Manager Handbook* while QMD and ASQ headquarters partnered in the development of the *Quality Manager Certification Section Refresher Training*. Duke Okes and Russell T. Westcott wrote and edited both offerings. Those two publications and the third edition of the *Principles of Quality Costs*, edited by Jack Campanella, are in heavy demand through ASQ Press.

Updated certification exam

About 900 applicants sat for the March 2001 Certified Quality Manager Exam, the first to use the updated Body of Knowledge. More than 1,100 took the October exam, the last offered under the previous Body of Knowledge. Now we know why the numbers were so high in October. Everyone wanted to get in "under the wire."

I want to thank everyone who participated in the quality manager survey that went out during the Body of Knowledge update. I received many calls and comments about the survey. The conversa-

tions were positive and constructive and supported our efforts to improve the discipline of quality management.

This past year, QMD partnered with local sections to host conferences and forums. QMD co-hosted a conference in Pittsburgh last fall and the spring conference in Dallas this March. We partnered with the Charleston, South Carolina, section and Santee Cooper, the South Carolina Public Utility Authority, in an ISO Forum in April. I am delighted to see the division working closely with ASQ sections. Thanks to our QMD leaders and section partners.

QMD entered a new partnership this spring with the ASQ certification board to encourage the growth of the Certified Quality Improvement Associate exam. The exam, chaired by Dr. Missy Hartman, is our newest certification offering: the first for the non-quality professional. Designed as an entry into the world of quality, the

certification should attract more colleagues to our quest for organizational improvement. I encourage all QMD members to look at the exam, if not for you, then for entry-level staff and organizational partners. I am registered to take the exam in June. Stay tuned. I will tell you how I did.

New award

In his last letter, Jack Moran reported on recognition and awards given during the Quality Management Conference in February, including the Howard Jones Award that Jack Campanella received for long-term leadership and excellence. Don't miss the great picture in this issue of the *Forum* that shows three Howard Jones Award winners, Campanella, Dr. Roger Berger and Josh Tye, together at the conference. It was a great moment. We appreciate all that these QMD leaders have done for us.

Jack Moran kept one award a special secret until our February business meeting in Orlando: The Roger W. Berger Award. This new citation for continuing commitment and leadership, honors long-term volunteers who have excelled in a significant membership project. Roger received the first award, complete with plaque and Vermont Teddy Bear. He's undoubtedly the best man for the award. Thanks for all you have done for QMD, Roger. We love you.

Now, it's time to turn our sights to a new year. Look for more enhancements to the QMD website and the continued success of the *Forum*. The 14th annual Quality Management Conference and Quality Management Week will be February 27 through March 1, 2002 in New Orleans, Louisiana. To highlight the conference theme, "The Changing Face of Quality," our opening keynote speaker, Dr. Alan Robbins, president of New England Baptist Hospital and senior vice president of CareGroup in Boston, Massachusetts, will comment on the hospital's award-winning customer service.

Thank you for being a member of QMD. I am excited about serving you. Feel free to contact me at duffy@telli.trident.tec.sc.us or (843) 574-6145.

Grace L. Duffy

More than 1,100 took the October exam, the last offered under the previous Body of Knowledge.

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on the other indicators.

- Fourth, the measures are used to make decisions that result in specific actions.
- And finally, if progress toward the goal is lagging, the pilot (senior leader) can check two potential reasons: the flight plan (strategy) was not accurately followed; or environmental changes made the flight plan (strategy) obsolete.

How does one begin to implement a balanced scorecard? Here is the process, adapted from the outline in *Bullseye! Hitting Your Strategic Targets Through High-Impact Measurement* (Schiemann and Lingle, 1999).

Leadership team develops a strategy map

The balanced scorecard is not just about developing a more balanced set of measures; it is about using measurement in a more effective way. Senior leadership must start by understanding and agreeing with the concept of a measurement-managed organization.

Next, senior management needs to articulate the strategy and assumptions about the key success factors of that strategy. Key success factors include areas the organization must excel at in order to successfully implement the strategy. The output of this discussion is a strategy map, a pictorial representation of the strategy with cause-and-effect relationships shown by arrows. A good strategy map should have no more than 15 to 20 items to insure that organizations do not become DRIPs: Data Rich but Information Poor. In most organizations we have worked with, developing a strategy map with a senior team who has a strategic plan takes two to three full days.

Every organization's strategy map will look different because each map reflects the organization's unique strategy and key success factors. The map identifies the key areas that must be measured to track strategy implementation and test strategic assumptions.

Define measures and set targets

Form a measurement team to translate the map into concrete measures. The measurement team, a cross-functional, multi-level team, must complete five activities:

Table 1.

	Measurement Managed Organizations	Non-Measurement Managed Organizations
Clear agreement on strategy among senior management	93%	37%
Effective communication of strategy to organization	60%	8%
Open sharing of information	71%	30%
High level of teamwork among management	85%	38%
High levels of self-monitoring of performance by employees	42%	16%
Willingness by employees to take risks	52%	22%

From John H. Lingle and William A. Schiemann, "Is Measurement Worth It?" *Management Review*, March 1996 56-61.

1. Learn about the thought process that went into the strategy map. For example, why is the leadership team interested in gross margin from new products instead of total sales? Why are they more concerned with market share by segment than by new customers? What are the cause-and-effect relationships the senior team sees?
2. Evaluate the assumptions in the strategy map. Is there knowledge from the organization's lower levels that would refute any of the assumptions or add new elements? Work out any disagreements between senior leadership and the measurement team before moving forward. Both groups must be fully committed to the strategic assumptions and talk about them in a similar manner.
3. Identify actual metrics that will be used to track each element of the strategy map.
4. Make recommendations on performance targets for each measure and determine the areas in which stretch goals seem appropriate.
5. Have the senior leadership team review and approve this balanced set of metrics and goals.

Cascade measures through the organization

Next, the organization begins to educate employees on the strategy map and the balanced-scorecard approach. As employees become educated, each group or department in the organization validates the strategy map. Continually testing the assump-

tions of the strategy map at each successive layer builds commitment to, not just knowledge of, the strategy.

Each group selects parts of the strategy map on which it has an impact and develops its own measures for those parts of the strategy map. As measures are developed, it is important to keep an eye on the 80-20 rule. What are the most important issues and measures to impact? By linking each group's measures to the strategy map, the measures will be balanced and will link to the core strategy and its key success factors. Reducing the number of measures to the critical few helps keep the organization focused.

Collect, share, analyze, act on data

Once the measurement approach is designed, data are collected and used to guide the organization to form decisions. Each group uses its own data, which may be rolled up into higher-level indices that are reviewed by senior leadership. All levels of the organization should review its measures from two perspectives. First, what does the tracking data indicate about progress toward goals and strategy implementation? And second, what does the relationship between changes in different measures indicate about the group's strategic assumptions?

Understanding the relationships among different data streams lies at the heart of strategic thinking. But, even beyond validating the strategy, thinking about the rela-

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Improving the Process Is not Process Improvement

By Mel Adams, Christoph Disch, Michael Kinney and Bernard J. Schroer

Beginning in the early 1980s, managers enthusiastically embraced process-improvement techniques based on Japanese principles of quality management. Some managers struggled to Americanize the Japanese approach. Others simply treated quality like any other fad program.¹ Quality has become a basic business requirement for nearly all firms in major U.S. industries, but process improvement has become a key competitive weapon in the drive to reduce costs and satisfy customers, now that downsizing has been shown to have little lasting effect on financial performance.²

Many managers sincerely believe that they practice process improvement. They can recite examples of specific improvements in key processes. Some managers show learning curves that document improvement. Some can quickly relate how a problem led to a creative, if not obvious, tactical solution, or to a radical innovation that resulted in significant productivity gains. By itself, improving processes through problem solving is not systematic process improvement. It is little wonder that many managers are disappointed by their problem-solving approaches to quality management.

Using in-depth interviews with many executives and managers, we have contrasted ten key dimensions of the problem-solving paradigm with the emerging systematic and continuous process-improvement paradigm. This new paradigm challenges many basic assumptions of traditional management theory.⁴ Many managers believe that process improvement cannot be managed systematically in job shops, service organizations, batch production or union environments. However, systematic improvement usually makes dramatic gains in organizations because the inherent inefficiencies are so much greater. We also show how the fundamental values of each paradigm result in characteristic managerial behaviors that help determine corporate culture and effectiveness.

Managers use problem-solving paradigm

It is easy for managers to focus on daily operational problems. In engineering and business schools, U.S. managers have been trained in problem solving, both as a scientific methodology and as a management technique.^{5, 6}

Problem solving is taught as the primary technique for addressing a range of situations from fighting production fires to stimulating innovation. As a management paradigm for improving processes (see Table 1), problem solving can be characterized as tactical, individual-hero based, ad hoc, mistake/fix oriented, driven by finances, pro-

find creative solutions that get the organization over a hurdle. Even though a committee was appointed to work on the problem, one person usually identifies the solution and saves the day. Some organizations formalize the hero by creating the roles of troubleshooter, expediter or customer service representative. These employees become formal heroes, which institutionalizes problem solving as a cultural value and corporate strategy.

Problem solving is ad hoc

For many managers, problem solving is most useful and necessary when problems occur; so process improvement happens intermittently. This spasmodic approach

Table 1.

Problem Solving vs. Process Improvement		
Dimension	Problem-Solving Paradigm	Process-Improvement Paradigm
1. Emphasis	Tactical	Strategic
2. People	Individual heroes	Teams
3. Duration	Ad Hoc / Sporadic	Systematic / Continuous
4. Focus	Mistakes / Fix	Systemic / Opportunity
5. Goals	Passive / Modest	Aggressive / Stretch
6. Structure	Program	Cross-Functional
7. Key Stakeholders	Managers / Shareholders	Customers
8. Relative Cost	High	Low
9. Key Driver	Financial	Mission/Purpose
10. Management Role	Administrators/Maintainers	Leaders/Change Agents

gram structured and high cost. The ten characteristics of the problem-solving paradigm are presented in the following sections.

Problem solving is tactical

By definition, problem solving addresses specific issues in operational efficiency, not overall effectiveness. Because the problems are immediate, they tend to be defined narrowly, addressing symptoms not root causes. The resulting solutions are quick fixes that are more tactical than strategic. Every day, managers get caught up in working on what is urgent, not what is important.

Employees become heroes

When asked who improves processes, most managers will cite key employees who

usually assumes that no improvement is needed until a problem occurs. Thus, no urgency or momentum is generated for continuous, relentless improvement as a cornerstone of strategy.

Focus is on mistakes

Problems that managers identify usually are related to performance failures. These problems are either from special causes or from common bottlenecks and inefficiencies. Although the latter are well known to management, nothing is done until symptoms surface through customer complaints, plant shutdowns, cost overruns or poor performance reviews. Then management initiates an effort to fix the most apparent prob-

lem. Even if the underlying process is improved, the fix is most likely a patch that reinforces the current system. Some managers can cite improvements in product design or tasks that simplify manufacturing and help the organization down the learning curve, but cannot describe any structured approach that facilitated the gain.

Goals are passive, modest

As many organizations practice it, problem solving aims to treat the immediate symptom and restore operations to previous performance, not to improve performance dramatically. With no clear, ambitious goals for process improvement in terms of cycle time, quality, cost or delivery, real improvements in the underlying process tend to be accidental, modest and perhaps temporary, until the next breakdown occurs. Some managers keep issuing ambiguous, hollow challenges to the troops while other managers fail to challenge employees by setting low improvement targets in the 1-5% range. If goals are set so modestly, short-term attention will achieve the target temporarily without changing the underlying behavior of the personnel and the operation of the process. This amounts to working harder, not smarter. When next month's goal focuses on a new problem, the operation soon reverts to its old behavior and level of performance.

Program solves recent problems

In problem solving, it's typical for management to announce a new campaign to solve the most recent problem. This program may take the form of new technology ("We need more money"), training ("It's the employees' fault"), austerity initiatives ("It's the competition's fault"), de-layering ("It's middle managers' fault"), or even process reengineering ("We need more computers to handle all this data!"). Employees quickly become cynical as each new program replaces the most recent failure. With a short life expectancy and no real link to strategy, employees view each new "program" skeptically.

Stakeholders are internal

Problem solving in organizations usually focuses on satisfying top management, on an individual middle managers meeting a goal, or on another internal customer. External customers, especially end users, seldom enter the discussion,

since the problem is defined in terms of internal stakeholders' requirements. The further down in the organization the manager that is being placated, the greater the probability of a quick fix. When an internal focus is combined with functional autonomy, weak values and poor integration, management has developed fertile conditions for suboptimization.

Systematic improvement usually makes dramatic gains in organizations because the inherent inefficiencies are so much greater.

Costs are high

Problem solving frequently leads to engineering projects that take six to 12 months to generate a solution. The solution then requires major investment and a capital budgeting exercise that stretches over more than a year. Even in normal operations, as each lower-level manager uses problem solving in futile attempts to meet conflicting goals, inventory, tooling and paperwork costs mount and further increase cycle times.

Finances drive solutions

Problem solving goes hand in hand with a management philosophy grounded in financial performance. Management has confused the organization's purpose with the financial scorecard that focuses on metrics such as gross or net margin, turnover, utilizations or efficiency ratios. Customer satisfaction, cycle time and process improvement tend to be off the radar screen. Such managers drive the top and bottom lines without understanding the key processes that generate revenues and incur costs. Proposed high-cost fixes get delayed in the ensuing capital budgeting process, reinforcing management control and further slowing down improvement. Efforts to initiate process improvement usually get quashed in a chorus of calls for cost/benefit analysis.

Managers administer programs

Top management behavior is the root cause of all the factors listed above. Executives of a problem-solving organization usually are more interested in a reward for maintaining the current paradigm and system than they are in discovering new

ways of doing business or developing real leaders. Organizational change may be significant and ongoing in terms of product or market, yet performance declines. Since top management's underlying behaviors have not changed, the organization's systems, processes and employees continue their same inefficient, increasingly obsolete behaviors across successive fads.

Overall, the characteristics of problem solving we listed describe a long-established paradigm of management. Employees' operational frustrations often result in individual behaviors that generate some improvement in the process and performance through problem solving. Thus managers may be able to provide data showing good learning curves on various product/service lines. Although necessary, problem solving by itself is insufficient to improve processes systematically. By default, it ends up being primarily a technical approach, with little structured effort to harness the creativity of employees. For whatever reason and by whatever mechanism, many practitioners of this entrenched paradigm are learning another, richer paradigm that uses problem solving more appropriately. In the process-improvement paradigm, problem solving is just one of many techniques to effect strategic change.

Process improvement adds customer value

In contrast to problem solving, process improvement is a management philosophy and strategy that aims to dramatically increase value as defined by customers.^{2, 7, 8, 10} As a paradigm, process improvement can be characterized as strategic, team-based, systematic, aggressive, continuous, cross-functional, customer driven and low cost. Leaders are change agents that help the organization achieve its mission and purpose through ever-improving systems. Before describing each characteristic of the process-improvement paradigm, we outline the key tactical approach at the heart of the change in behavior.

One of the basic mechanisms for continuous improvement is a kaizen event (see Figure 1), a focused one- to five-day team improvement effort with a specific focus determined after an assessment of operations and discussion with management.

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With an aggressive, yet achievable, goal in mind, the facilitator trains a focus group. After several hours of training on techniques, the team goes to the shop floor to improve the process. After observing and sketching the process and work sequence, team members collect cycle and operation times and then compare work content to takt time, the rate at which customers require the product to be produced. The team then brainstorms opportunities to improve the process by documenting problems, causes and possible countermeasures. After evaluating all suggestions, the team implements changes to the process by iteratively trying various countermeasures. On the last day, the team documents and presents the results and recommendations to management. Beginning the next week, the facilitator follows through with any additional implementation actions not completed during the kaizen. The ten characteristics of the process-improvement paradigm are presented in the following sections.

Process improvement is strategic

Because the effort to improve processes is customer focused, mission driven, systematic, systemic, aggressive and continuous, it also is strategic. Management plans, organizes and manages process improvement as a key strategy for the organization. Everyone learns that process improvement is key to achieving collective and individual goals. Since the focus is on improving customer value, management works on what is most important, not what is most urgent. In most cases, compressing cycle times in product development, manufacturing, logistics and customer service improves customer value.

Creative employees form improvements

In the process-improvement paradigm, teamwork is both a core value and a strategy. Tapping the creativity of employees is the key to process improvement, and is best achieved through focused small teams that challenge every assumption of the current approach under the guidance of a facilitator. Neither the facilitator nor the team members become heroes since they reach the aggressive improvement goal together. A critical driver of systematic process improvement is the amount of training provided to employees, not the presence or

number of cross-functional teams. World-class organizations have dramatically increased training capability, with some now averaging as much as 35 days of training per employee per year. Team-based training helps institutionalize both individual and collective learning that soon becomes the driver for improvement, performance gains and cultural change.

Efforts are continuous

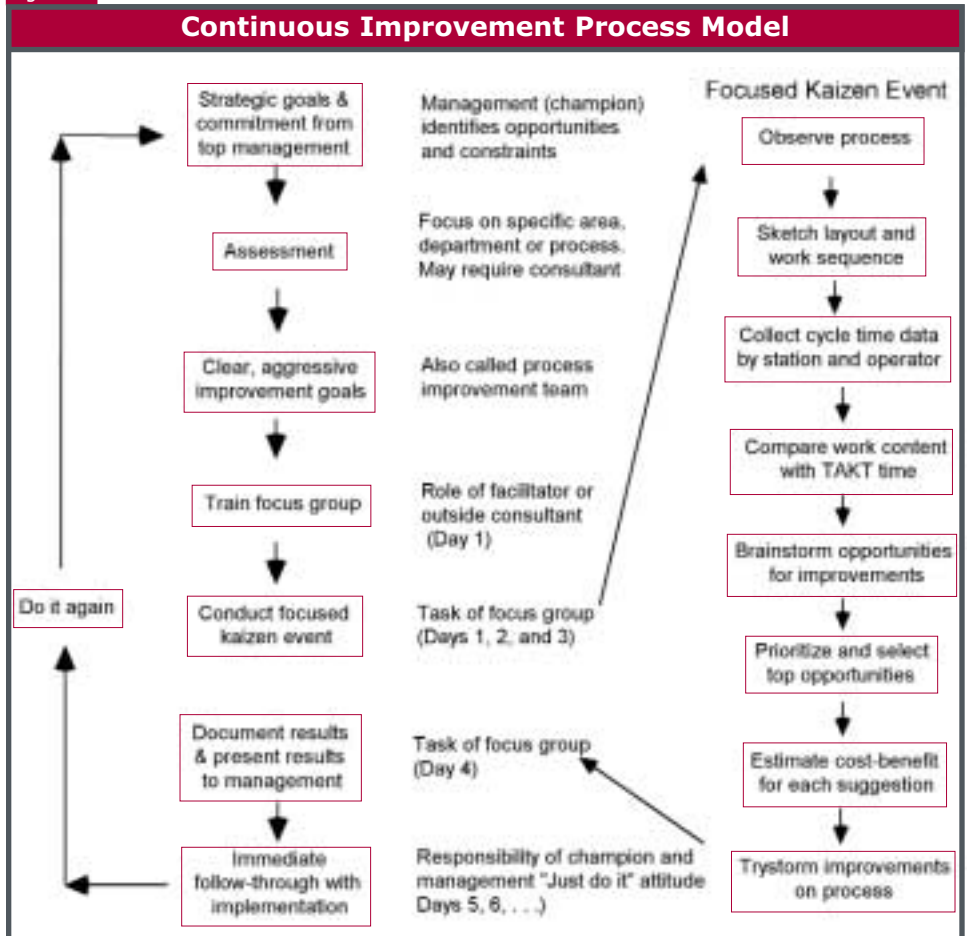
The improvement effort is planned and managed like any other function, program

relentlessly attacks processes, including repetitive kaizens on the same process by different groups. "Continuous," the forgotten word in process improvement, means that process improvement activities are both scheduled and regular, part of the implementation plan for fulfilling the mission, compressing time and increasing customer value and satisfaction.

Improvement is systemic

Rather than focusing on specific problems, the continuous improvement effort

Figure 1.



or department. As an integral part of the strategic plan, the champion develops and communicates long-term and annual improvement plans with budgets, staffing plans, goals and valuation metrics. Since goals tend to be cross functional, action plans focus on the important integration and waste-reduction tasks. Because there is always potential for further gains, even at maximum capacity or efficiency, there is no room for complacency or resting on one's laurels for the latest improvements. Thus, systematic process improvement

must focus on rethinking individual processes to maximize the effectiveness of the whole system. This helps avoid suboptimization that usually occurs when problems are solved to meet an individual department's or manager's goal. Thus, a manager's responsibility is to improve the system for the common good, rather than to meet personal or departmental targets. No manager can systematically improve processes while fighting special causes in a system statistically out of control; managers must work together to improve the system

that is in statistical control by reducing the sources of variation and, at the same time, improving cycle times, quality and responsiveness. The whole organization can be energized by the hundreds of opportunities for improvement, not demoralized and disenfranchised by the overwhelming number of problems people face individually.

Goals are aggressive

Many managers assume that a system is near capacity with no room for improvement. But employee creativity can remove the upper limits on potential improvements. Instead of fixing the problem, process improvement assumes that major gains are possible with focused creativity. Goals must force all involved to rethink how the operation can be redesigned for radical, permanent change. Usually, such complete rethinking of the way work is done is accomplished only if a Big Hairy Audacious Goal (BHAG) quickly takes participants out of tweaking mode. Typical BHAGs include a 20% gain in productivity or 50% reduction in inventory or setup times. Although counter to Deming's principles, stretch objectives can be very effective in energizing and focusing teams.

Team structure is cross-functional

Since many non-value-added activities grow out of obsolete, bureaucratic transactions between departments and functions, process improvement usually is organized around teams that include all stakeholders in the process. Outsiders frequently are included in focus groups simply for objective, creative eyes on the process. This cross-functional inclusiveness in the new paradigm is perhaps the single most important factor in restoring the balance between specialization and integration, respectively the strength and weakness of any hierarchical structure. Cross-functional structures also are more effective than matrix structures that retain the program focus of the old paradigm. As just another member of the focus group, the manager can quickly demonstrate a new reliance on employees.

Customers drive improvement

Since the customer defines value, all processes must be viewed from the customer's evaluation of whether value is being added. Process improvement focuses on increasing the real and perceived value to

the customer by reducing waste in all processes in the system. Indeed, process improvement provides a basic vehicle for employees to find meaning in their work as they strive to better serve customers. Many managers now send employees to customers' plants to experience first hand the market's changing requirements for better value.

Costs are low

Process improvement first attacks the barriers to performance gains that yield the greatest impact on time compression and customer responsiveness for the least cost. Management and focus groups prioritize potential improvements, then focus first on what can be implemented immediately at very low cost. Capital investments often prove unnecessary or non-economic after lower cost improvements are implemented.

Managers are now realizing that work must be meaningful in terms of helping customers, and that management and the organization must keep a higher purpose at the forefront of daily operations.

Mission motivates employees

It has taken U.S. managers far too long to realize that employees are not motivated best by corporate financial goals, even though financial compensation remains the dominant extrinsic motivation. Instead, managers are now realizing that work must be meaningful in terms of helping customers, and that management and the organization must keep a higher purpose at the forefront of daily operations. New paradigm leaders focus on the relative value created for end-use consumers and the contribution to quality of life for all.

Management is the change agent

Process improvement demands that people throughout the organization become leaders, not administrators. The key people include a champion at the top of the local organization chart and a full-time facilitator dedicated to growth and to organizing, teaching and leading teams through the follow-through steps. A competent, respected facilitator who is focused on improving the total system leads the daily attacks on busi-

ness-as-usual. As the champion for change, the leader must get everyone to rethink why and how he or she does business, must convey a sense of urgency, and must initiate the new paradigm through training and by helping the facilitator follow through with implementation. Individual teams also allow new leaders to emerge from the operating level and from staff positions.

Overall, the above characteristics of process improvement describe the emerging paradigm of management. Employees' operational frustrations and creativity are stimulated and channeled in the organized, focused improvement activity. After the kaizen event, employees provide data showing actual gains that improve customer value. While this new paradigm makes full use of an even broader array of technical tools, it is fundamentally a behavioral approach with its systematic structure for harnessing the collective learning of employees. Used in an integrated, structured fashion with minimal capital investment, process improvement not only is necessary, but, when leveraged with effective information and marketing technologies, it often is sufficient to meet the organization's strategic goals.

When to use problem solving and process improvement

Process improvement is almost universally appropriate, but especially when changing strategy. For example, process improvement has been demonstrated widely in moving from a focused factory to lean manufacturing or when switching from build-to-stock to demand-based production scheduling. According to *Industry Week*, the Baldrige Awards and other references, process improvement has achieved dramatic results in a wide variety of organizations, including not-for-profit public and private organizations, union, non-union and employee-owned organizations, publicly traded and closely held firms, service organizations, and high-tech and low-tech organizations.⁹

In difficult situations, real change can take more than a year to yield dramatic, bottom-line financial results. Process improvement can maximize gains when combined with other grand strategies. For example, process improvement can complement a turnaround strategy to realign an obsolete organization with its evolving competitive

(IMPROVING PROCESS, continued from previous page)

environment. In markets and industries competing on short product life cycles and rapid technology development, process improvement can develop significant, sustainable competitive advantages. When growth is based on rapid acquisitions, process improvement can improve the acquisition process, the performance of acquired firms and the integration of acquisitions into the parent firm. In each of these special situations, leaders play the key role in driving process improvement as the underlying paradigm.

Problem solving may still be an appropriate response under certain circumstances. For example, when a valued customer demands immediate action to meet an unusual need, management and employees must respond. Even if processes are in control, the organization may lack the flexibility or capacity to meet the immediate need. Management must solve the problem and follow up immediately to determine if a process-improvement team is needed to attack the underlying cause. However, problem solving must not be used as the first response in every unusual situation, or management and employees will revert to business-as-usual problem solving.

Finally, in the process improvement paradigm, problem solving remains in the manager's toolbox. But problem solving as a generic approach is more effective when employees are given specific tools and techniques for changing the way work is done. Such tools essentially equip employees, both mentally and technically, to use problem solving more effectively. The Seven Basic Quality Tools can be leveraged with real-time team training on preventing mistakes via poka yoke, eliminating the eight wastes (*muda*), asking "Why?" five times on each opportunity, striving for one-piece flow through cells with a visual factory, minimizing downtime via single-minute exchange of dies (SMED), total productive maintenance (TPM), kanbans and work balancing.

Changing from problem solving to process improvement

In most organizations, especially those that recently downsized, the primary excuse for not practicing process improvement is, according to one manufacturing executive, "finding the time to quit running beside the bicycle and hop on." There are at least

five key elements to making the transition from problem solving to process improvement. All of them are behavioral rather than high-cost technical fixes.

1. Develop and communicate the

vision. The top manager must become a champion for change. First develop a new, long-term view of what is possible and desirable for the organization to become. An inspiring, motivating outcome must be presented in terms that give employees a larger purpose in life than making widgets to collect a weekly paycheck. The champion must communicate and demonstrate that management respects and supports employees.

Problem solving as a generic approach is more effective when employees are given specific tools and techniques for changing the way work is done.

2. Change the strategy and performance

measures. To execute the vision, the champion must lead by developing and implementing a customer-value strategy. This strategy includes a new set of performance measures that emphasize significantly better customer responsiveness via shorter cycle times. Switching to non-financial, customer-value-based metrics may be the most difficult behavioral change for management.

3. Train employees on goal-setting, team-building tools, metrics, language and process.

To begin a time- and customer-value-based strategy, the champion must train key employees, facilitators and middle managers on setting aggressive goals, working as a team, and developing new tools and metrics for time compression. Changing the organization's language may substitute for and emphasize key words that reinforce the new paradigm. The change in paradigm occurs not with training on specific improvement tools but in the new customer-focused behaviors of management and employees that yield results and refocus the culture.

4. Dedicate resources. The champion must dedicate talent to the change process by appointing a full-time facilitator and protecting this individual

from the usual problem-solving behavior. Facilitators must be technically competent, good communicators and teachers, respected by employees and focused on change. Together, the champion and facilitators can reorganize employees in cells to tap collective group intelligence and maximize the benefits of peer pressure. The champion must allow the facilitator to quickly get the parts, tools, fixtures, etc. needed by the focus groups to make improvements. For those changes that need more time or capital to implement, the champion must also find the resources for improvements that meet strategic criteria.

5. Recognize and reward team accomplishments.

Finally, the champion must change symbolic and substantive behaviors that tell and show employees what is important. To emphasize process improvement, the champion can focus on what employees are doing differently to experiment with change. The champion must recognize successes, help all to treat failures as learning experiences and publicly reward all process gains at every level of the organization. Part of the cultural change will refocus recognition and rewards on teams rather than individuals.

To be more competitive globally, managers must learn to use problem solving as one tool in a new systematic management approach focusing on systemic, continuous, customer-focused process improvement. A structured problem-solving process, focused on uncovering and implementing countermeasures for the root cause of a problem, is indeed a valuable and effective weapon against "fire-fighting." But superficial problem solving and its more sophisticated cousins differ from process improvement in both paradigm and effectiveness. Leaders learn how to get beyond fire fighting to focus on system redesign and process improvement. The fundamental assumptions behind the new paradigm are so different that management behaviors must change to complete the paradigm shift. The change process must start at and be led by top management, with new behaviors focused less on technical roles and more on coaching and facilitating roles. As evidenced by

(IMPROVING PROCESS, continued on page 14)

CALL FOR PAPERS

14th Annual Quality Management Conference

The 14th Annual Quality Management Conference will be held during Quality Management Week at the Hyatt Regency New Orleans February 25 through March 1, 2002. The conference theme is "**The Changing Face of Quality.**" Quality Management Week will include four- and eight-hour tutorials on Wednesday, February 27, and one- and two-hour paper presentations on Thursday, February 28 and Friday, March 1. The proposed tracks for conference papers include: (1) International, (2) Academia, (3) Basic Applications, (4) Advanced Applications, and (5) Quality Management Tools.

Program Chair, Art Trepanier, is currently soliciting proposals for tutorials and conference papers. If you or any of your peers wish to present a tutorial or paper at this conference, please submit your proposal to Art Trepanier via e-mail at art.d.trepanier@lmco.com or trepanier@airmail.net by July 31, 2001. Proposals should include a brief abstract, presentation length, a biographical summary, and complete contact information. At a minimum, contact information should include name, title, company name, mailing address, phone, and E-mail address. Proposals for conference papers should also include the suggested paper track.



Suggested topics include but are not limited to:

- Knowledge management
- Quality managers' impact on the bottom line
- Cost and cycle-time reduction
- Supply chain management
- Manufacturing at multiple locations and countries
- Lean manufacturing concepts
- Managing part-time, temporary, and contract workers
- Implementing strategic initiatives
- Quality tools to improve performance excellence in the day-to-day operations
- Audits and assessments as a basis for improving quality



The papers should be presented in a manner whereby attendees will be able to gain an understanding from practical examples and have the ability to implement knowledge gained from the conference to immediately improve organizational performance.

If you have any questions or require additional information, please contact Art at work from 6:30 AM until 5:00 PM Central Time at (972) 603-2925 or at home at (972) 618-3887.

Art Trepanier, Program Chair
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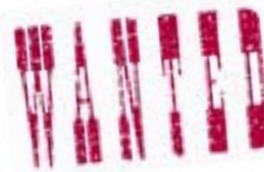
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Are You A Leader?

By Harry P. Richard

Leaders are people whom other people want to follow.

As an experienced quality manager, I have observed that many managers lack leadership qualities. Being a leader requires a commitment to serving the company and serving the employees.

Do a self-assessment to see how your management style or the style of your manager corresponds with these four leadership principles.

I first learned how to be a leader in the U.S. Army. The Army teaches several leadership principles that focus on how to be a military leader; however, four of these principles are directly related to the business world. As a quality manager, I used four leadership principles that helped me demonstrate leadership. Do a self-assessment to see how your management style or the style of your manager corresponds with these four leadership principles.

Be competent

Employees respect managers who are competent. There are many ways to demonstrate work competence. The best way is to have an in-depth knowledge of the technology a group is working on. Managers who broaden their knowledge can assist group members when they encounter an obstacle. While employees respect managers who empower them, they also respect managers who are available to offer help when necessary.

Another way to demonstrate work competence is through certification programs. Certification programs help managers demonstrate their expertise in a particular area. These programs require classroom work, homework and a passing grade on an exam. Several professional organizations offer certification programs to managers, including the American Society for Quality (ASQ) and Registrar Accreditation Board

(RAB). ASQ administers quality certification programs such as certified quality engineer, certified quality manager, and certified quality auditor. RAB certifies many grades of quality management systems auditors.

Set the example

In the Army, setting an example simply meant that you go first into battle and last into the chow line. How does this translate into civilian life? Don't ask anyone to do something that you wouldn't do yourself. When there is a particularly tedious or boring job to be done, like a major record review or a major re-inspection, gather the quality team together, divide the work and take equal share for yourself. Setting the example also applies to smaller tasks. Managers who demand that their employees arrive at work on time should also arrive at work on time.

Keep employees informed

Employees will perform at their best when they understand how their job fits into the goals of the company. Knowing how their everyday work contributes to the goals of the company ensures that employees will identify deviations that may not be consistent with company goals. By identifying these deviations, management can get the work back on track quickly and save the company money. There are many ways to keep employees informed. On a large scale, newsletters are a great resource, especially

Certification programs help managers demonstrate their expertise in a particular area.

when a total quality management (TQM) team publishes the newsletter. On a smaller scale, managers can keep their employees informed through staff meetings, memos and e-mails.

Look after employees' welfare

Looking after the welfare of employees distinguishes leaders from managers. Sometimes, looking after the welfare of

employees conflicts with the goals of the company. For example, if all of a company's goals are directed toward profit, a manager may increase profit by reducing the workforce in a layoff and asking the remaining employees for increased productivity. This management style neglects to look after the welfare of the employees. A leader, however, would identify the problem within the company and work with the employees to find other solutions without reducing the workforce through layoffs.

Some managers view their position in their company as a means to accumulate personal wealth and make a profit for their stockholders. In contrast, leaders seek to find a balance between serving their company and serving mankind.

To be a successful manager, earning employees' respect and their willingness to follow, practice these four leadership principles:

Managers can keep their employees informed through staff meetings, memos and e-mails.

Be competent
Set the example
Keep employees informed
Look after employee welfare. ◇

Harry P. Richard is a quality consultant. He has a master's degree in management engineering from the University of Bridgeport, Connecticut. He previously was a TQM trainer for GE and has consulted for Dresser Industries. Contact him at 518-399-7316 or via e-mail, hrichard@nycap.rr.com.

Study Shows that Quality Pays Winners

By Mark A. Wrolstad, Ph.D. and Thomas M. Krueger, Ph.D.

Investors have been told for years that quality can be profitable. Most articles and studies concerning the link between quality and financial success have been written about the winners of the prestigious Malcolm Baldrige National Quality Award. Two factors make the award prestigious: it is a national quality award; and there's an artificial scarcity created by granting two or fewer awards in a category (small business, service and manufacturing) each year. Less known is the fact that most states in the United States have created similar awards that promote and reward organizational excellence.

State award winners

We decided to test the assertion that "quality pays" by analyzing the performance of state quality-award winners. Since dozens of state quality awards are granted each year, most people accurately assume that they are easier to win than the Baldrige. Investors looking for quality-oriented firms probably have wondered about the levels of achievement required to win a state award compared to the Baldrige. Corporate managers also may have wondered about the possible financial benefits of pursuing state quality awards. Our goal is to shed some light on these questions.

State quality awards typically are very similar in content and approach to the Baldrige award. States have modified Baldrige's all-or-nothing approach by creating different levels of achievement. Nearly all applicant companies can achieve some level of recognition. In addition to the top achievement level, formerly called "winning the award," states also cite silver, bronze, and similar levels of achievement. In states where different levels of achievement are possible, we considered only companies winning the top-level honors.

Financial status improves

A sample of 25 state quality-award winners from 1988 to 1996 was matched by size and SIC code with firms not winning quality awards. Table 1 shows the changes

in average calculated financial ratios during a four-year period. For an award won in 1990, the comparison would be between the ratios calculated from the 1988 and 1992 annual reports.

As Table 1 shows, there is a clear difference in the average improvement

States have modified Baldrige's all-or-nothing approach by creating different levels of achievement.

between the two groups of companies during the four-year period. Quality enthusiasts would probably attribute the changes in performance to changes in the culture and internal processes of award winners. Table 1 also shows that in every case, the award-winning firms made superior progress in improving performance measures. Especially dramatic was the change in the return on equity: an 18.73% improvement for award-winning firms ver-

Market performance is also superior

To look at how the stock market responded to state quality award winning efforts, we compared the market performance of state award winners to the matched firms two years before winning the award, the year of the award, and two years after winning the award. Table 2 shows award winners did better than the Standard & Poor's 500 but more poorly than the matched firms two years before the award. During the year of the award, the winning firm did better than the S&P 500 again and much better than the matched firms. Two years after the award, the winning firm again out-performs both the matched firms and the S&P 500. During the entire 5 years, we found that the award winner portfolio earned stockholders a 18.1% return compared to 16.2% for the matched firms and 13.0% for the S&P 500.

Let people know

As in Helton's study of Baldrige winners, state quality award winners seem to do better than average. Helton found that his portfolio of award winners returned 99.0% on principal while

Table 1. **Percent Changes Over Four Year Period***

Measure	Award Winners	Match Companies
Operating Margin (NI/Sales)	1.13%	-1.71%
Operating Profit Margin (EBIT/Sales)	46.77%	2.69%
Return On Assets	10.28%	-5.50%
Return On Equity	18.73%	-5.91%

* Average change in calculated ratios

Table 2. **Changing Market Values***

Period	Award Winners	Matched Firms	S & P 500
Two years before award	16.8	25.1	7.8
Year of award	18.9	7.2	13.8
Two years after award	29.4	20.3	18.4
Total five year period	18.1	16.2	13.0

* Average annualized percentage change in outstanding market value (share price times number of shares outstanding).

sus a negative 5.91% for the matched firms. Another significant difference in performance was the dramatic improvement in operating profit margin: 46.77% for the award winners versus 2.69% for non-winning companies.

the Dow Jones Industrials returned 41.9% and the S&P 500 returned only 34.1%. During the entire five-year period, we found that investors bid up the amount

(QUALITY PAYS, continued on page 14)

Candidates Ask Questions About Certification

By Wendy Lambert

Exam candidates attending a Quality Manager certification session during February's Quality Management Division Conference in Orlando asked questions about issues that also should interest anyone who plans to take the exam.

Attendees at the session run by Duke Okes, QMD vice chair of technology, and Patty Westfall, chair of the exam committee, said they were confused about the impact of recent revisions to the Quality Manager Body of Knowledge on the certification exam. People also asked if the reason for the revision was to make certification more difficult to achieve. Some queried whether answers to the constructed response problems must be presented in the PDCA (Plan-Do-Check-Act) format.

Here are answers to those and other frequently asked questions:

Q. *How is the Quality Manager Certification Exam different now that the Body of Knowledge has been revised?*

A. The exam format has not changed. As in previous exams, there are still 150 multiple-choice questions, worth one point each, and a constructed-response section, worth 30 points. The revision to the Body of Knowledge affects the content of some questions and refocuses the exam on leadership and strategic issues.

One significant and positive change in the constructed-response section is that candidates now can choose to answer two of the three constructed-response problems. The choice gives candidates much more flexibility in responding to those problems that best reflect their capabilities and mastery of quality management concepts.

Q. *Does the recent revision mean that the exam is more difficult?*

A. No, the exam isn't more difficult. ASQ reviews the Body of Knowledge every five years to ensure that it reflects current practices in the field. ASQ adheres to internationally recognized assessment standards in developing its certification exams, and periodic review and revision of the

Body of Knowledge is in keeping with these standards. When an adjustment is necessary, no attempt is made to make the exam more rigorous or to change the minimum performance standards in any way.

The review begins with a job-analysis survey. Input on current quality management practices is solicited from thousands of already-certified quality managers, along with other subject-matter and measurement experts. Survey results form the basis of a test specification that defines the major areas of the Body of Knowledge and describes test particulars for each topic area.

ASQ adheres to internationally recognized assessment standards in developing its certification exams.

Q. *How is the exam reviewed for clarity and fairness?*

A. To make the exam as fair as possible, and to ensure that there are no ambiguous or misleading items, a diverse committee of certified quality managers looks over the exam before it is given each time. The committee reviews and verifies the validity of multiple-choice items through the supporting reference text. The process ensures that each question is consistent with published literature and that there is only one correct answer.

The committee also reviews constructed-response problems, spending a great deal of time making sure that the problems are stated clearly, and that candidates can use tools and concepts that reflect current quality management practices and answer in the time allotted.

Q. *Is the Quality Manager Exam more difficult than other ASQ certification exams?*

A. First, it is important to understand that each ASQ exam is developed independently and should not be compared with others in any way.

The Quality Manager Exam does differ from other ASQ programs. It is the only exam that includes constructed-response or essay-type problems. This portion of the exam is "closed-book" – no reference materials can be consulted – and the candidates have 45 minutes to respond to the two problems. The testing method is of value because candidates can demonstrate their ability to think strategically, formulate appropriate solutions or action plans, and communicate the results appropriately. The challenge these problems present reflects typical on-the-job experiences of a quality manager.

The passing rate for the Quality Manager Exam is consistent with the rate for other ASQ certification exams. The percentage of successful candidates is roughly the same as for the Certified Quality Engineer and Certified Quality Auditor Exams.

Q. *Why isn't a score breakdown given to passing candidates as it is to unsuccessful candidates?*

A. Though the specifics are still being worked out, ASQ is responding to this concern.

Sheila Connolly, ASQ Certification Department psychometrician, recently addressed the issue this way: "In an effort to respond to candidates who want to improve themselves, Certification Department staff are looking into producing a more general information sheet for passing candidates. This information would identify the two or three areas in which candidates could improve their performance in terms of the Body of Knowledge being tested."

Certification as a quality manager is an achievement that demonstrates a level of expertise in quality management tools and principles. The ASQ Certification Department and the volunteers who serve on the exam committee strive to develop and refine the exam to best represent the knowledge and skills needed by today's quality managers.

For a complete version of the new Certified Quality Manager Body of Knowledge and the bibliography, visit the QMD website, www.ASQ-QMD.org. ♦

Quality Management Division Online News

The members-only section of the Quality Management Division (QMD) web site, available since mid-June, is partitioned to provide members with exclusive information.

The members-only section offers many interesting articles about quality principles, practices and management. Other pages

The members-only section offers many interesting articles about quality principles, practices and management.

provide practical information or point to other sites of interest. New pages will be added as the division works to make this site a useful resource.

Two significant additions to the web site — the articles and links sections — have many long-term benefits for members.

Forum articles, plus others

The articles section contains our research and reading archive. Here are articles from previous issues of *The Quality Management Forum*, past conferences and other member-contributed commentaries. Because access to softcopy versions of previous issues is limited, online copies of the Forum only go back to Summer 2000.

To submit articles for publication, see the "How To Get Published" guide available on the web, http://asq-qmd.org/forum_how.html. Be sure to review the author guidelines at http://asq-qmd.org/forum_author.html. Address questions to Forum editor, H. Fred Walker, at hfwalker@usm.maine.edu.

Useful links

The links section identifies Internet sites about management, human resources, quality, business, or other places that provide articles, research, news or guidance that may be helpful to new and experienced members. Recommendations and submissions are accepted from any member.

Specific guidelines are listed in the members-only section.

ASQ sends e-mail news, announcements

Most American Society for Quality (ASQ) members provided their e-mail addresses to ASQ so they can receive announcements and newsletters. If you have already done this, you will also receive information from QMD electronically. Just remember to keep your e-mail address up to date so you won't miss anything. If you have not provided ASQ with your e-mail address, please consider doing so. It is an easy and convenient way to receive the latest information. ◇

Conference Papers Available on CD-ROM

Miss the 13th Annual Quality Management Conference but want to read the papers? The proceedings, on CD-ROM, are available through the American Society for Quality's (ASQ) headquarters by calling 800-248-1946. Each CD, item number T1378, costs \$25.

The web site password for the next quarter will be *JURAN*

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(BALANCED, continued from page 3)

tionships begins to generate a culture change. It forces everyone in the organization to think more about process flows and less about functional areas. It spurs more "systems" thinking, and more strategic thinking at every level, and results in more teaming. Research has demonstrated that implementation of a balanced scorecard creates a more committed workforce, and a more team-oriented, process-focused, agile organization. (See Table 1 on page 3.)

As employees become educated, each group or department in the organization validates the strategy map.

Summary

In summary, the balanced scorecard is a set of measures derived from corporate strategy, used at all levels of the organization to align employees' activities with the strategy, and reviewed by senior management to track strategy implementation as they test strategic assumptions. However, the real power of the balanced scorecard is its impact on "the cultural fabrics of organizations and [their] fundamental attitudes toward such things as what information should be shared, how decisions should be made, what effective leadership involves, and what types of behaviors get recognized and rewarded." (*Bullseye!*, p. 13.) ♦

Dr. Nancy Nygreen, president of Nygreen Management, is a senior examiner for New York State's Empire State Advantage program and president-elect of the Fairfield, CT chapter of the American Marketing Association. She works with organizations to design measurement programs, facilitate improvement teams and conduct Baldrige audits. Reach her at 914- 428-8731 or nancy@nygreen.com.

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(IMPROVING PROCESS, continued from page 8)

Industry Week's growing annual list of world-class manufacturing operations, the number of managers who have been able to learn new behaviors and change paradigms is encouraging.⁹ Leaders can be made, not just born.

Acknowledgements

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(QUALITY PAYS, continued from page 10)

Two years after the award, the winning firm again outperforms both the matched firms and the S&P 500.

paid for shares issued by award-winning firms by 18.1% annually, compared to 16.2% for the matched firms, and 13.0% for the S&P 500. ♦

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