DRIVEN
by
Metrics

In 50 Words Or Less

- Performance metrics can have a serious impact on an organization.
- Selecting the most appropriate metrics and determining how they will be used can be the most challenging task for any organization.
- These measures must be modified over time to reflect changes in the marketplace and your organization's shift in strategy.

by Duke Okes
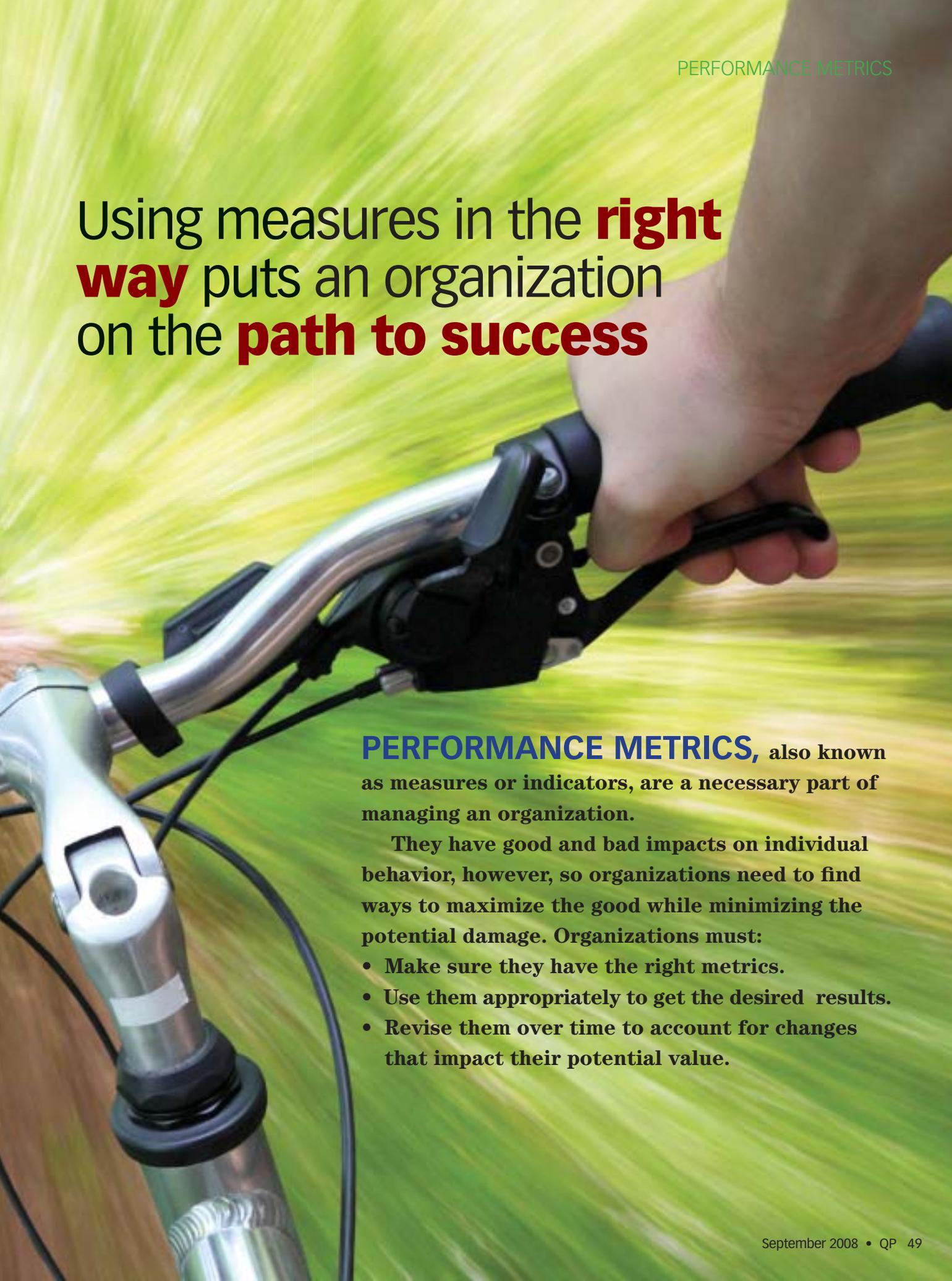
Using measures in the **right way** puts an organization on the **path to success**

PERFORMANCE METRICS, also known as measures or indicators, are a necessary part of managing an organization.

They have good and bad impacts on individual behavior, however, so organizations need to find ways to maximize the good while minimizing the potential damage. Organizations must:

- Make sure they have the right metrics.
- Use them appropriately to get the desired results.
- Revise them over time to account for changes that impact their potential value.

How to select performance metrics

Getting the most from metrics requires having the right ones and deploying them well. Far too many organizations have a tendency to select metrics by copying what competitors, companies written up in the business press and benchmarked firms are using.

While knowing what others are doing can be useful, each organization—if it's going to be successful—must have its own strategic niche. Therefore, it needs metrics that keep it focused on its strategic direction, not the direction in which others are going.

Organizations should:

- Define a competitive (versus arcane) vision and a strategy to achieve it.
- Set objectives aligned to the vision and strategy.
- Create processes to deliver on that vision and strategy.
- Set metrics that will monitor how well they are doing on the objectives. That will allow those managing the processes to keep them going in the right direction.

This isn't to say that you can't learn by studying others. But the purpose of looking at benchmark firms should be to interpret how their metrics support their strategy and their business model. Even if two companies target the same market niche, how they choose to succeed in it will likely differ based on their competencies, resources and cultures.

For example, one call center in a particular metropolitan area might focus on hiring older wage earners who want to supplement their Social Security incomes. Another call center in the same area might focus primarily on college students. The call centers' concerns about employee turnover might therefore be significantly different because one has a related metric that wouldn't apply for the other.

A simple but important step in metrics selection is applying the Pareto principle to ensure the critical measures are available while not swamping the organization with a lot of noise. One company struggling with implementation of a new quality management system (QMS) had 20 or more metrics posted in each department, but there were none for evaluating how well the QMS project was actually progressing. Once a couple of simple metrics were established, the company rapidly and successfully completed the project.

Types of metrics

Another problem is having the right mix of the different types of metrics available. For example, some metrics should focus on customer needs (externally focused, effectiveness metrics) and some on organizational needs (internally focused, efficiency metrics) so the organization can effectively balance the management of resources used to achieve the market results. An organization with high customer satisfaction and costs that create negative profitability is not going to be a sustainable venture.

Some metrics should be able to evaluate results (outcome or lagging metrics), while others should allow proactive management of the vital factors (process or leading metrics) that create those outcomes.

For example, on-time delivery (an outcome) might be significantly impacted by equipment reliability (a leading indicator for delivery performance). However, equipment reliability is an outcome measure for the maintenance management process.

The right **metrics will be useful only** if the resulting information is available for **those who can act on it.**

In addition, the use of some measures over a long period will be necessary to manage ongoing processes, but other metrics might be set up only for a short period to diagnose a problem situation.

For example, a local meal delivery service might collect data on traffic congestion to optimize its delivery routes.

As much as possible, metrics should be biased toward business drivers, such as process or leading indicators, instead of outcomes. This requires, however, knowing the complex multivariate relationship between the organization's metrics, an area in which business analytics and business intelligence software can provide significant help.

Details, details, details

Once the desired metrics have been identified, the real work begins. Decisions must be made regarding:

- Who owns the metric.
- Where will the data be acquired and how often.
- How might the raw data be manipulated (normalized) to allow more equivalent comparisons over time.
- How often should the metrics be reported and analyzed for decision making.

Although it might sound simple, creating operational definitions is an important component of metric details. In other words, what is meant by the terms as expressed in mathematical terms (for example, numerator, denominator and time boundaries)? A company might ask, "What is meant by on-time delivery? When it is picked up by the carrier or when it arrives at the target location?"

Other important details might include the target level, internal baseline data and benchmarks to be used for comparisons. Table 1 is an example of a worksheet for organizing the details.

How well do the metrics interrelate?

One difficult but vitally important issue is evaluating the metrics for gaps, alignment and conflict. Alignment determines whether metrics at various levels (vertical alignment) and positions in the value chain (horizontal alignment) all point in the same strategic direction. Looking for gaps or conflicts means being aware of inherent imperfections in performance metrics and using a systems view for managing the organization.

There are several formats for evaluating alignment. The outline and tree formats are easy to understand. The outline format is the simplest and arranges metrics in a hierarchy starting with the highest level outcomes. Each metric that directly impacts these metrics is listed in a second-level indented format. Each of the metrics that impacts the second level metrics is then listed in a third-level indent. Table 2 shows a partial example and lists the owner of each metric.

The tree format shows the same information beginning with the high-level outcomes at the top and flowing down to lower levels. Simply showing the alignment is not sufficient, however, as the polarity of the cause-and-effect relationship between each set of two metrics is important; that is, as one particular metric increases, what will be the impact on those above it? Will they be impacted positively or negatively?

Detailing the metrics / TABLE 1

Metric	Skill-based training effectiveness
Owner	HR
Operational definition	Number of people who achieve desired competency level/number of people trained
Data source	Training course test results
Frequency to gather	Six months (July and December)
Normalization	Convert to percentage
Baseline	76%
Target period 1	82%
Target period 2	88%
Target period 3	94%

Reporting results, taking action

The right metrics, of course, will only be useful if the resulting information is available to those who can act on it. The data must be available at the right frequency and in an appropriate format, and personnel authorized to act on the data must have ownership of the metrics and related processes.

For example, a company wanted to improve throughput of a process, and management previously provided feedback on process performance monthly. When management instead placed a piece of graph paper at the end of the process and asked the area personnel to plot their results each day, throughput quickly increased. Making

Metrics alignment outline format (partial example) / TABLE 2

1) Percentage of loyal customers (corporate)
   a) Customer satisfaction (corporate)
      i) On-time departures (operations)
         (1) Equipment reliability (operations)
            (a) Maintenance done on time
               (maintenance department)
      ii) Friendliness of counter staff (operations)
         (1) Training effectiveness (training)

the information available in real time allowed personnel to better understand the cause-and-effect relationships between their actions and results.

Data is typically more useful if presented in a time-oriented graph that allows comparison of each data point to past performance, often in a rolling time period format. Control limits and predesignating specific responses to results can help prevent inappropriate tampering. Caution should be taken when scaling graphs, as perceptions can be significantly impacted by poor Y-axis scaling. Figure 1 shows two different perspectives for the same data, impacted only by a change in the Y-axis.

Minimizing the damage from metrics

A lot of damage can occur in organizations when people play games and manipulate metrics to mask problems and make things look good. Some of the typical problems that can occur include:

- **Setting easy targets:** If compensation and rewards are based on whether people hit their targets, they might set targets they're sure they can meet, rather than stretch goals that will push the organization to breakthrough levels of performance.
- **Accelerating or delaying activities:** The end-of-month syndrome—rushing to make sure something is done so it can be counted in the current month's accounting results—is probably a good description of this. Alternately, if one month's targets have been hit, personnel might delay actions so the performance data will be counted with next month's results.
- **Suboptimization:** To maximize overall organizational (system) performance, you sometimes must be willing to suboptimize performance of some of the component parts (for example, departments or processes). While evaluation of metrics can point out these potential conflicts, the budgeting process in many organizations mistakenly promotes the concept of optimization by department.
- **Aggregation and segmentation:** While aggregate metrics allow a summary evaluation of several related segments, they can also create an averaging effect that removes details which might be important. At the same time, organizations might segment data in ways that show good performance in some areas and ignore the segments that are not good.

Other considerations

One problem performance-management personnel often run into is someone saying, "But you can't measure what is important here." While it is true that some measures of performance are more subjective than objective (for example, you can't simply purchase a device to measure it), this doesn't mean some measures can't be developed. It might just mean there will be a higher level of noise or uncertainty in the metric, not that it shouldn't be measured.

For example, think of the visual used by physicians to determine the degree of pain a patient is experiencing—several faces ranging from smiling (no pain) to frowning (some pain) to crying (a lot of pain). While two patients experiencing exactly the same level of pain (if it were measured objectively via an MRI, for example) might choose different levels on the diagram, it is how their subjective ratings change over time that is important to the patient and medical personnel.

How scaling impacts perspective / FIGURE 1
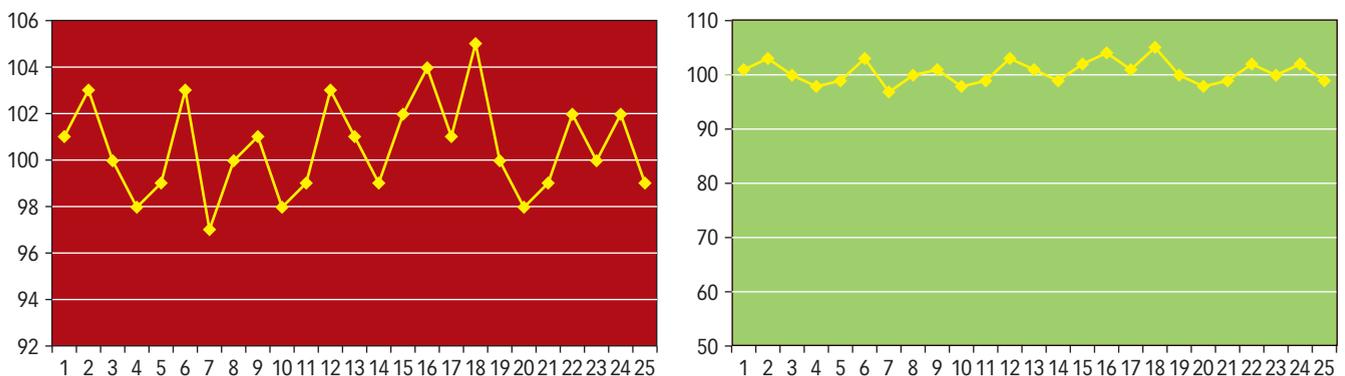
As much as possible, **metrics should be** biased toward **business drivers instead of outcomes.**

Another consideration is the tendency to implement metrics that measure how well the organization is performing now. But today's performance is no guarantee of tomorrow's, so metrics should also be developed around those factors that indicate how well the organization is building capability for the future. Examples include the number of new ideas for future exploration by research and development, demographic trend validation by marketing and in today's world, knowledge acquisition by just about anyone in the organization.

It is useful to reemphasize a major issue—the congruence of talk versus action. The organization must consider how well what it tells people to do (such as plans) aligns to what it measures and what it rewards. Misalignment will, at minimum, cause confusion—but more likely frustration—and perhaps cause people to take actions that are not in the best interest of any stakeholders.

Changes to metrics

Having a set of performance metrics that are working well is not the end of the story. It is a dynamic world in which we live, and metrics must be continually evaluate and updated. Obviously, if the organization's strategy shifted (for example, targeting a different market segment), revisions to metrics are likely to occur.

Different metrics might also be appropriate as the organization matures. For example, as the product line moves up the logistic curve, more commonly known as the S-curve or growth curve, metrics might shift from a marketing management orientation to more of a cost management orientation. Or, as an organization gains greater knowledge of cause-and-effect relationships (for example, drivers versus outcomes), there might be a shift in what is monitored and controlled.

Selecting and using performance metrics is a fundamental aspect of managing organizational performance. The same premises apply whether you are developing metrics for an entire organization, a division, a facility, a department or a process. What is important is how you can know how well you're doing, and how you can manage processes and resources to achieve the desired results.

One more problem with metrics, however, is they give us the impression we have control over our future. The reality is that organizations and the marketplace are complex systems with far more multivariate, bidirectional and nonlinear cause-and-effect relationships than humans can comprehend.

This isn't to say we shouldn't try to control things, but we need to be clear about the assumptions underlying the strategies, processes and metrics, and be constantly on the lookout for information that might indicate they are incorrect. QP

RECOMMENDED RESOURCES

Davenport, Thomas H. and Jeanne G. Harris, *Competing on Analytics: The New Science of Winning*, Harvard Business School Press, 2007.
Hubbard, Douglas W, *How to Measure Anything: Finding the Value of "Intangibles" in Business,* John Wiley & Sons, 2007.
Neely, Andy, *Business Performance Measurement: Theory and Practice,* Cambridge University Press, 2002.
Parmenter, David, *Key Performance Indicators: Developing, Implementing and Using Winning KPIs,* John Wiley & Sons, 2007.
Phelps, Bob, *Smart Business Metrics,* Trans-Atlantic Publications, 2004.
Spitzer, Dean R., *Transforming Performance Measurement: Rethinking the Way We Measure and Drive Organizational Success*, American Management Association, 2007.

DUKE OKES is a consultant focused on helping organizations improve root cause analyses. Okes holds a master's degree in education from Tusculum College, Greeneville, TN. He is an ASQ fellow and holds the following ASQ certifications: quality auditor, engineer, manager of quality/organizational excellence and technician.

MUCH MORE ON METRICS

QP's archive includes additional articles on measurement and statistics. Items are organized by seven subtopics: software and technology, information management, data quality, metrics, metrology, reliability and statistical process control. Visit www.qualityprogress.com to find more about your area of interest.