

Measuring Long-Run and Nonfinancial Organizational Performance



LEARNING OBJECTIVES

After completing this chapter, you should be able to answer the following questions:

- 1 Why should company management focus on long-run performance?
- 2 Why is a vision statement so important to a firm?
- 3 How do long-run objectives differ from short-run objectives?
- 4 Of what value are nonfinancial performance measures to managers?
- 5 What should managers consider when selecting nonfinancial performance measures?
- 6 Why is it important for managers to develop bases for comparison for performance measures?
- 7 How can activity-based management be used in long-run performance evaluation?
- 8 What difficulties are encountered in trying to measure performance for multinational firms?
- 9 How can a balanced scorecard be used to measure performance?
- 10 (Appendix 1) What steps need to be taken to implement a new performance measurement system?
- 11 (Appendix 2) What are some major areas of a manufacturing company for which performance measures and their cost drivers have been delineated?

WMC (Western Mining Company) Limited of Australia was incorporated in 1933 as a gold exploration, mining, and management company. It has diversified and expanded to become one of the world's largest resources companies. WMC is comprised of five competitive and world-class core businesses: copper/uranium, alumina, nickel, fertilizers, and gold.

The company has stated its vision as being "a minerals company determined to be BEST." BEST has been defined as the aims of (1) Bottom-line performance; (2) Environmental responsibility; (3) Safety and well-being of our people; and (4) Teamwork. To promote this vision, WMC has established underlying objectives for these aims, some of which are short term but many of which are long term.

Specified strategies and measurable targets have been set for each commodity. For example, the 1997 annual report indicated a strategy for the gold business as being "to achieve economies of scale by developing large, low-cost operations, and acquiring and exploring for gold in the most favorably endowed locations." Targets for gold operations for the period July 1, 1997, to December 31, 1998, were to:

- Reduce the unit total cost of sales by more than 10%.
- Have combined lost time and medically treated injury frequency rate below 30 per million hours worked.
- Reduce the number of environmental noncompliances.

SOURCE: WMC Limited, *1997 Annual Report to Shareholders* and <http://www.wmc.com.au> (October 28, 1999).

Historically, managers focused on short-run performance measures almost exclusively while ignoring the long-run implications of short-run outlooks and most performance measures that were nonfinancial in nature. In part, such tunnel vision was caused because managers were commonly judged on a short-term basis and because long-run and nonfinancial performance data were often not captured in the accounting system and, thus, were unavailable for managerial purposes. With increased global competition, world-class companies such as WMC Limited have begun to recognize the virtues of using long-run and nonfinancial performance measures.

Although short-run financial performance measures cannot and should not be eliminated, the benefits of long-run and nonfinancial performance measurements are being highlighted by both professional literature and corporate success stories. Enlightened chief executive officers such as Hugh Morgan at WMC are well aware that there must be a balance between short-run and long-run activities and their measurements for a company to thrive in today's global economy.

Management must conduct company affairs in such a way that both the firm's short-term and long-term needs are met. Short-term needs are associated with current period operating, financing, and investing activities. These needs and their measurements, discussed in Chapter 19, tend to be primarily financial. This chapter addresses the long-range and nonfinancial performance of a firm. What seems efficient in the short run may not be in the company's long-run best interests.

1

Why should company management focus on long-run performance?

VISION AND MISSION STATEMENTS

Developing a company vision statement is a necessary step in the chain of management endeavors to perform well in the future. To be useful, a **vision statement** should provide a conceptual view of the organization's future that is better than its present. The statement should provide a unifying focus on which all company personnel can base their decisions and behaviors. Thus, all employees will be working for the same long-run results. The accompanying News Note discusses the importance of vision statements.

2

Why is a vision statement so important to a firm?

vision statement

NEWS NOTE



GENERAL BUSINESS

What a Vision Statement Does

A unifying, clarifying vision is [extremely] important to the interdependent organization, in which the leaders expect their people to participate in the process of delivering (and, in the best of cases, helping to create) the vision. In my opinion, we need vision for a number of critical reasons:

To guide us. Like the stars that have guided sailors to their destinations and safe harbors for millennia, an articulated vision leads us from point to point on our organizational journey. It also aligns our various priorities and goals and keeps us from fragmenting.

To remind us. The same organization that can remember one of its mistakes for years can forget what it represents and wants to become in a matter of months. Like the Declaration of Independence, a vision should be something we can reflect on during the coming years to remember the important “whys.”

To inspire us. People, at least the sane ones who have a life, are not inspired by work in and of itself. Rather, they

are inspired by the purpose of work, the result of work and the transcendent priorities and goals it encompasses.

To control us. When we get the “crazies” and start wandering into unrelated businesses or core incompetencies, our vision statement can snap us back to reality.

To free us. It’s hard to have a forward-looking, high-performance organization when we don’t know who we are or what we want to become. The events of our past push us along with their inertia, to a chorus of “this is the way we’ve always done it” in the past. A living vision pulls us loose from that mire and opens the door to a fresh future.

SOURCE: James R. Lucas, “Anatomy of a Vision Statement,” *Management Review* (February 1998), pp. 22–26. Copyright © 1998 American Management Association International, New York, NY. Reprinted by permission. All rights reserved. <http://www.amanet.org>.

Collis P. Huntington, founder of the Newport News Shipbuilding and Dry Dock Company created a model vision statement in 1886. It reads:

*We shall build good ships here.
At a profit—if we can.
At a loss—if we must.
But always good ships.¹*

Notice that the statement is short, to the point, and gives greater importance to ship quality than to profits. Mr. Huntington was a frontrunner in recognizing that customer satisfaction will, in most cases, lead in the long run to profitability.

mission statement

A **mission statement** expresses the organization’s purposes and should identify how the organization will meet its targeted customers’ needs through its products or services. The mission statement must support the firm’s vision statement. WMC’s statement of purpose follows:

Our business is to maximize shareholder value by finding, acquiring, developing and operating mineral resource projects throughout the world. We will maintain a diversified portfolio of commodities and exercise prudent financial management. To achieve our purpose, we will develop and retain top quality people, management, skills and technology.²

values statement

In addition, a **values statement** can be generated that reflects the organization’s culture by identifying fundamental beliefs about what is important to the organization. These values may be objective (such as profitability and increased market share) or subjective (such as ethical behavior and respect for individuals). WMC’s values statement details a commitment to

- the safety, health, and well-being of all people affected by its activities,
- ethical behavior and compliance with its Code of Conduct,

¹ Richard C. Whitely, *The Customer Driven Company* (Reading, Mass.: Addison-Wesley, 1991), p. 21.

² WMC Limited, *1997 Annual Report*, p. 1.

- responsible management of the environment,
- mutual understanding and respect for indigenous and local communities, and
- success in its business.³

Note that both WMC's mission and values statements include identification of multiple classes of internal and external stakeholders. Additionally, the values statement, considered in order of presentation, could be taken to indicate that the company believes that business success will follow from a concern about people, ethics, and the environment.

Mission, vision, and (if provided) values statements are the underlying bases for setting organizational goals (abstract targets to be achieved) and objectives (more concrete targets with quantifiable performance measures and expected completion dates). Goals and objectives may be short term or long term, but they are inexorably linked: Without achieving at least some short-run success, there will never be a long run; without engaging in long-run planning, short-run success will probably fade rapidly.

DIFFERENCES IN PERSPECTIVES

3

How do long-run objectives differ from short-run objectives?

Traditionally, managers have measured performance based almost solely on financial results. But concentrating on financial results alone is analogous to a baseball player, in hopes of playing well, focusing solely on the scoreboard. Both the game score and financial measures reflect the *results of past decisions*. Achieving success when playing baseball and when managing a business requires that considerable attention be placed on actionable steps for effectively competing in the stadium, whether it is the baseball stadium or the global marketplace. The baseball player must focus on hitting, fielding, and pitching; the company must focus on performing well in activities such as customer service, product development, manufacturing, marketing, and delivery. Performance measurement for improving the conduct of these activities requires tracking of statistical data about the actionable steps that the activities involve.⁴

Managing for the long run has commonly been viewed as managing a series of short runs. Theory held that if a firm performed well in each of its short runs, then its future was secure. Although this approach has some appeal, it fails when the firm has not kept pace with long-range technical and competitive improvement trends. An organization needs time to improve its technology, human resources, and modes of operations. If managers think solely in terms of short-run performance and ignore the time required to make long-term improvements, the firm may be doomed in the global competitive environment. Some problems with traditional short-term financial performance measurements are listed in Exhibit 20-1.

- Unrelated to strategic goals
- Irrelevant to managerial decision making
- Add little or no value to business or customer
- Too late
- Clog the information systems
- Send false positive signals
- Create barriers to improvements
- Send wrong messages

SOURCE: Lakshmi U. Tatikonda and Rao J. Tatikonda, "We Need Dynamic Performance Measures," *Management Accounting* (September 1998), p. 50. Copyright by Institute of Management Accountants, Montvale, N.J.

EXHIBIT 20-1

Shortcomings of Traditional Performance Measures

³ Ibid.

⁴ Joseph Fisher, "Use of Nonfinancial Performance Measures," *Journal of Cost Management* (Spring 1992), p. 31.

In a sense, the long run never arrives: Future periods become the short run as soon as they become current and other periods replace them as the future. Even so, managers must focus on continuous improvements for the long run so that when the future becomes “now,” the company will be strategically able to survive and prosper. For example, in the 1950s, Japan’s automobile manufacturing companies were poorly financed and struggling to survive. Product quality was extremely low. Managers in these firms were motivated to adopt approaches such as kaizen, total quality management, and just-in-time processes to efficiently raise quality and lower costs. Such methods normally require years of dedication and commitment before implementation is truly effective and substantial benefits can be realized. This strategy was based on a belief that profitability and liquidity, both short-run measures, would result as the long run became the present. By making this commitment to the long run, these companies gained significant market share. Managing the long run requires building long-term relationships, proactively making investments in people and technology, and exerting effort according to a plan confidently believed to yield beneficial results in the future.

Short-run objectives generally reflect a focus on the effective and efficient management of current operating, financing, and investing activities. Although these objectives are predominantly financial, they may also be concerned with immediate customer satisfaction issues such as quality, delivery, cost, and service. In contrast, a firm’s long-term objectives involve resource investments and proactive efforts made to enhance the firm’s competitive position. Unfortunately, competitive position results from the interaction of a variety of factors. This situation requires that the firm be able to identify what factors are the most important contributors to the achievement of a particular long-run objective. Thus, as discussed in Chapter 4 relative to costs, the firm needs to determine the underlying *drivers* of competitive position, not just the predictors. For example, predictors of increased market share might include increased spending on employee training or capital improvements. But the true drivers of increased market share are likely to be an organization’s product and service quality, speed of delivery, and reputation relative to those similar attributes of its competitors.

During each short-run period, the organization is striving not only for short-run success, but also toward achieving its long-run objectives. Although achievement will not be known until the future has become the present, the organization should establish its performance measurement system to ascertain long-run progress. The measurements used may need to be nonfinancial ones rather than the financial ones typically used to determine short-run success. One way to classify these nonfinancial measures is into the following four categories⁵:

- operational measures (including administration, customer service, and human resources),
- customer measures (including product development, order processing, and inventory),
- soft measures (including shortages frequency, late shipments, and delivery errors), and
- employee measures (including staff turnover and staff morale).

Such nonfinancial metrics are appropriate in the performance measurement system under the following circumstances: if they can be clearly articulated and defined; if they are relevant to the objective; if responsibility can be ascertained; if valid data can be gathered; if targets can be set; and if internal and/or external benchmarks can be established. Under these conditions, such measurements are appropriate for the managerial purposes of planning, controlling, decision making, and evaluating performance.

⁵ Andrew Campbell, “Performance Measurement—Keeping the Engine Humming,” *Business Quarterly* (Summer 1997), pp. 40–47.

NONFINANCIAL PERFORMANCE MEASURES

Performance can be evaluated using both qualitative and quantitative measures. Qualitative measures are often subjective; for example, a manager may be evaluated using simple low-to-high rankings on job skills, such as knowledge, quality of work, and need for supervision. The rankings can be given for an individual on a stand-alone basis, in relationship to other managers, or on a group or team basis. Such a system is discussed in the accompanying News Note. Although such measures provide useful information, at some point and in some way, performance should also be compared to a quantifiable—but not necessarily financial—standard.

4

Of what value are nonfinancial performance measures to managers?

<http://www.ford.com>

5

What should managers consider when selecting nonfinancial performance measures?

Selection of Nonfinancial Measures

Individuals are generally more comfortable with and respond better to quantitative measures of performance because such measures provide a defined target at which to aim. Quantifiable performance measures are of two types: financial and nonfinancial. Nonfinancial performance measures (NFPMs) “rely on data outside of a conventional financial or cost system, such as on-time delivery, manufacturing cycle time, set-up time, productivity for the total work force and various measures of quality.”⁶ According to the Institute of Management Accountants’ *Statement on Management Accounting Number 4D*, NFPMs have two distinct advantages over financial performance measures:

1. Nonfinancial indicators directly measure an entity’s performance in the activities that create shareholder wealth, such as manufacturing and delivering quality goods and services and providing service for the customer.
2. Because they measure productive activity directly, nonfinancial measures may better predict the direction of future cash flows. For example, the long-term financial viability of some industries rests largely on their ability to keep promises of improved product quality at a competitive price.⁷

Additional advantages are listed in Exhibit 20–2.

GENERAL BUSINESS

NEWS NOTE



What Grade Did I Make?

A new Ford Motor Co. evaluation policy could leave some of its top 20,000 executives in the sort of cold sweat they haven’t experienced since college. Ford is instituting a global performance-review system for 2000 that’s similar to the college practice of grading on the curve: Ten percent of the executives will get A’s, 80 percent will get B’s, and 10 percent will get C’s. Those getting C’s will see their raises, bonuses and stock options go to the folks who get the A’s and B’s. And if someone gets a C two years in a row, he or she may be demoted or fired, according to an internal company memo.

“This program is designed to improve the interaction and coaching between employees and their managers,” said Ford spokesman Ed Miller. “We want a lot of feedback—from the people being rated as well as from the managers.” The program will be revisited at the end of 2000.

SOURCE: Knight Ridder Newspapers, “Ford Execs Must Now Make Grade,” (*New Orleans Times-Picayune* (December 24, 1999), pp. C1–2. Reprinted with permission of Knight Ridder/Tribune Information Services.

⁶ Peter R. Santori, “Manufacturing Performance in the 1990s: Measuring for Excellence,” *Journal of Accountancy* (November 1987), p. 146.

⁷ Institute of Management Accountants (formerly National Association of Accountants), *Statements on Management Accounting Number 4D: Measuring Entity Performance* (Montvale, N.J.: NAA, January 3, 1986), p. 12.

EXHIBIT 20-2*Advantages of Nonfinancial over Financial Performance Measures*

Nonfinancial performance measures

- are more relevant to nonmanagement employees because they are generally more familiar with nonfinancial items (such as times and quantities) rather than financial items (such as costs or profits);
- are more apt to indicate where problems lie or where benefits can be obtained because nonfinancial data are more timely than historical financial data;
- are less likely to cause dysfunctional behavior or suboptimization because nonfinancial measures tend to promote long-term success rather than the short-term success promoted by financial measures;
- can be more easily structured to measure organizational effectiveness because nonfinancial measures can be designed to focus on processes rather than simply outputs;
- can be more easily structured to measure teamwork because nonfinancial measures can be designed to focus on outputs that result from organizational effort (such as quality) rather than inputs (such as costs);
- are more likely to be crossfunctional than financial measures, which are generally “silo” related;
- are more likely to indicate organizational success because nonfinancial measures (such as on-time delivery) can be more easily benchmarked externally than financial measures (which can be dramatically affected by differences in accounting methods); and
- can be more easily tied to the reward system because nonfinancial measures are more likely to be under the control of lower-level employees than are financial measures.

An organization must determine which areas are key to long-term success and develop specific metrics for these areas. The accompanying News Note indicates some activities that are critical to most organizations. At WMC Limited, safety and health, the environment, and indigenous peoples are also considered critical success factors. Policies have been established for each of these areas that point to a dedicated commitment to integrate long-run ramifications into short-term decisions, as indicated in the following quote about environmental performance and shareholder value:

Poor environmental performance poses a potential risk against meeting the Company goals, and a risk to the financial well-being of the Company. That makes environmental protection a core business for WMC. . . .

Good environmental performance contributes to company reputation which is a positive for shareholder value. The challenge is to demonstrate the linkage between the two. I believe that financial institutions and investors are increasingly looking to management indicators, additional to financial metrics, such as environmental performance, to assess a company's capabilities to manage all aspects of business risk.⁸

For each success factor chosen, management should select some short-run and long-run attribute measures to properly steer the company's activities toward both immediate and long-range success. For example, a short-range success measure for quality is the number of customer complaints in the current period and a long-range success measure for quality is the number of patents obtained for quality improvements of the company's products. It is up to the organization to decide how and how often to measure performance in these areas. There is likely to be considerable interdependence among some of the measures. For instance, increased product service should increase customer satisfaction.

Choosing appropriate performance measures can significantly help a company focus on the activities that cause its costs to be incurred and, thereby, attempt to control those costs and improve processes. These measures may be frequently related to the activity cost drivers discussed in Chapter 4 on activity-based management. Control the activity and the cost resulting from that activity is controlled.

⁸ Don Morley, *WMC Limited Environment Progress Report 1998*, p. 23.

GENERAL BUSINESS



NEWS NOTE

Measure What You Want to Manage

Faced with global competition, the reengineering fallout of the 1980s merger wave, and increasingly active institutional investors, corporations are focusing more than ever on new performance measures. [A Conference Board's study group] indicated that a growing number of major companies are developing performance measures characterized as "non-traditional" or "non-financial." The study group concluded that these measures should be labeled "key"—to be converted through a company's process of strategic achievement into more recognizable financial outputs such as sales, profits, and rate of return on investment. Typical key measures, which are meant to capture not only the value of existing assets, but also the potential for future performance, include:

- Quality of output
- Customer satisfaction/retention
- Employee training
- Research and development investment and productivity
- New product development
- Market growth/success
- Environmental competitiveness

Key measures are intended not to replace, but to augment, more traditional historical and financial performance measures. Only those activities that are actionable and will lead to enhanced performance should be measured. By tying key measures to the strategic vision of the company, there is assurance that as the vision changes so do the measures.

SOURCE: Deloitte & Touche LLP, "Challenging Traditional Measures of Performance," *Deloitte & Touche Review* (August 7, 1995), pp. 1–2.

The nonfinancial performance measures that could be used are limited only by the imagination. Notwithstanding this, using a very large number of NFPMs is counterproductive and wasteful. Management should strive to identify the firm's critical success factors (CSFs) and to choose a few qualitative attributes of each CSF to monitor for continuous long-run improvement. Critical success factors are those believed to be the direct causes of achievement or nonachievement of organizational goals and objectives.

Establishment of Comparison Bases

Once the NFPMs are selected, managers should establish acceptable performance levels to provide bases of comparison against which actual statistical data can be compared. These benchmark comparison bases can be developed internally (such as from another world-class division) or determined from external sources (such as competitors, regardless of whether they are in the company's industry). Unless a manager analyzing data has a basis for comparison, usually little meaning can be assigned to actual results. An appropriate basis for comparison allows the manager to assess meaning from the actual data.

Managers need to agree to assign specific responsibility for performance and to be evaluated in each area in which a performance measurement is to be made. In this regard, a system of monitoring and reporting comparative performance levels should be established at appropriate intervals. Exhibit 20–3 on page 906, reflects a responsibility hierarchy of performance standards, with the broader issues addressed by higher levels of management and the more immediately actionable issues addressed by the lower management levels. It represents a good blend of short-run and long-run performance measurements. Note also that the lower-level activities are monitored more frequently (continuously, daily, or weekly), whereas the upper-level measures are investigated less frequently (monthly, quarterly, and annually). Those measures used by middle management (in Exhibit 20–3, the Plant Manager) are intermediate links between the lower- and upper-level performance

6

Why is it important for managers to develop bases for comparison for performance measures?

measures and require monitoring at intermediate points (weekly, monthly, and annually). The annual measurements can be plotted to reveal long-run trends and progress toward long-run objectives.

A general model for measuring the relative success of an activity compares a numerator representing number of successes with a logical and valid denominator representing total activity volume. For example, delivery success could be measured for the period as follows (with assumed statistics provided):

$$\begin{aligned} \text{Delivery Success Rate} &= \# \text{ of On-time Deliveries} \div \text{Total Deliveries} \\ &= 822 \div 1,000 = 82.2\% \end{aligned}$$

EXHIBIT 20-3

Performance Measurement
Factors and Timetables

If a competitive benchmark for on-time delivery success had been previously set at 85 percent, success would be evaluated at close to, but slightly below, the mark.

Critical Success Factor		Critical Success Factor		Critical Success Factor		Critical Success Factor		Critical Success Factor	
QUALITY	Freq.	CUSTOMER SERVICE	Freq.	RESOURCE MANAGEMENT	Freq.	COST	Freq.	FLEXIBILITY	Freq.
VP Manufacturing Scorecard									
Design defect systems	Q	On-time shipment %	M	Inventory days	M	Total value-added cost per unit	A	Training days per employee	A
Process defect systems	Q	Order fill complete %	M	Output per equipment \$	A			Average cycle times of key products	A
Approved control plans	Q			Output per square feet	A				
				Output per total labor \$	Q				
Plant Manager Scorecard									
First-time test yields	W	Schedule attainment	W	Manufacturing cycle time	M	Variable cost per unit	M	Schedule attainment	W
% characteristics capable	M	Scheduled vs. emergency visits	M	FG inventory days	W	Total plant cost per unit	A	Manufacturing cycle time	W
Supplier rejects	W	Number of crisis calls	M	Days vendor lead time	M				
Department Manager Scorecard									
Tolerance success rate—Component A	D	Daily schedule attainment	D	Certified operations	W	Utility cost per unit	W	Changeover time	W
Tolerance success rate—Component B	D			Machine downtime	D	Material usage	W		
Amount of Component C	D			% good output	D				
				Unplanned schedule changes	D				
A = Annually Q = Quarterly M = Monthly W = Weekly D = Daily									

SOURCE: Adapted from Mark E. Beischel and K. Richard Smith, "Linking the Shop Floor to the Top Floor," *Management Accounting* (October 1991), p. 28. Reprinted from *Management Accounting*. Copyright by Institute of Management Accountants, Montvale, N.J.

In contrast, management may prefer that a failure rate be measured. If near perfect to perfect performance is expected, using a failure rate would indicate the degree to which perfect performance did not occur. If success were defined as total quality, the benchmark would be 100 percent on-time deliveries. The delivery measurement can be adapted to reflect nonperformance and, using the same information as above, would be as follows:

$$\begin{aligned}\text{Delivery Failure Rate} &= \# \text{ of Late Deliveries} \div \text{Total Deliveries} \\ &= 178 \div 1,000 = 17.8\%\end{aligned}$$

In this case, the benchmark is implied as zero errors, and the company was unsuccessful at achieving its performance goal. If, however, this failure rate were less than the prior period's, the conclusion can be drawn that improvement is occurring. Analysis of the types and causes of the 178 late deliveries should allow management to consider actions to eliminate these causes in the process of continuous long-term improvement.

Appendix 2 to this chapter presents numerous nonfinancial performance measures that can also be viewed as cost drivers in an activity-based costing system. Care must be taken, though, to evaluate all selected measures relative to one another and make certain that any competing or inhibiting measures are eliminated. Additionally, the number of performance measurements used for any given area must be limited. Top management should choose several measures on which to concentrate during a period; those measures should be the ones most reflective of the company's objectives for that time frame.

Use of Multiple Measures

A progressively designed performance measurement system should encompass various types of measures, especially those that track factors considered necessary for world-class status. The "performance pyramid" (Exhibit 20-4, page 908) summarizes the types of measures needed at different organizational levels and for different purposes. Within the pyramid are measures that consider both long-term and short-term organizational objectives. These measures can be financial and nonfinancial.

Although internal measures of performance are used, the true measure of performance is judged by a company's customers. Good performance is typically defined as providing a product or service that equals or exceeds a customer's quality, price, and delivery expectations. Such a definition of good performance is totally unrelated to internal measurements such as standard cost variances or capacity utilization. Thus, nonfinancial measures that detect the degree to which customer desires are being met are becoming more important. Companies that cannot meet quality, price, and delivery expectations will find themselves without customers and without any need for financial measures of performance.

Knowing that performance is to be judged using external criteria of success should cause companies to implement concepts such as just-in-time inventory management, total quality management, and continuous improvement. Two common themes of these concepts are to make the organization, its products, and its processes (production and customer responsiveness) better, and to provide better value through lower costs.

Exhibit 20-5 (page 909) provides ideas for judging managerial performance in four areas. Some of these measures should be monitored for both short-run and long-run implications. For example, a short-run measure of market improvement is the growth rate of sales transactions. A long-run measure is the growth rate of the repeat customer pool constituting the customer base. Forming employee groups to "brainstorm" about the identification of both short-run and long-run measures can be an effective approach to identifying what measures to use. A particular set

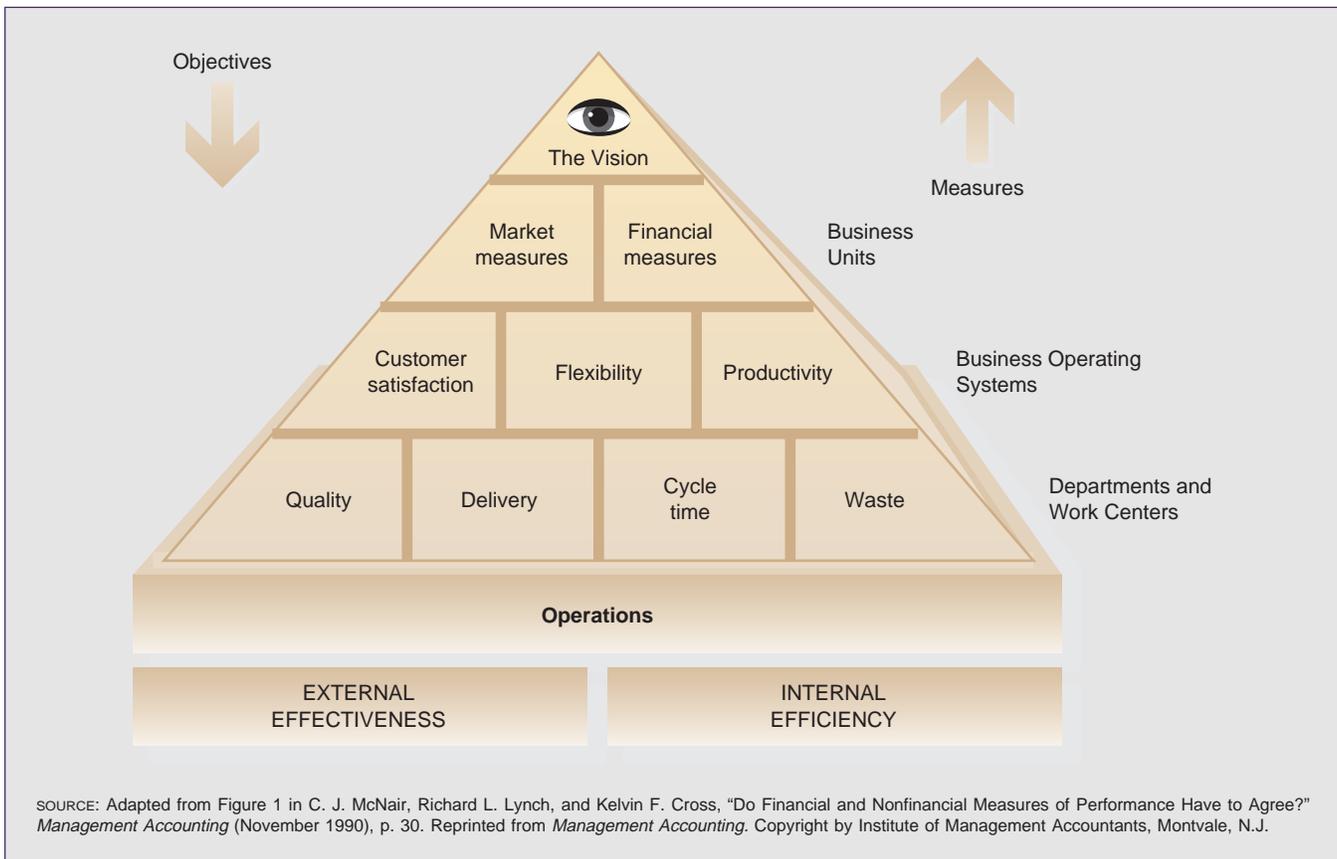


EXHIBIT 20-4

The Performance Pyramid

of performance measures reflects a company management's expectations and philosophies. If management's philosophy changes, many of the performance measures will also change, as indicated in the following passage:

Performance measurements are the emblems of a management philosophy because people measure what they consider important. When the philosophy of management changes, the measurement systems change—or should change. However, changing measurement systems is more difficult than reworking a machine. Performance measurement is the basis of every system in a company: cost systems, planning systems, capital budgeting systems, personnel assignments, promotions, reorganizations, budget allocations—the mechanisms, built up over years, by which everything runs.

Major overhauls bring out the same emotions as if the perpetrators were to hold a rock concert in a cemetery. Performance measurement changes are only possible with strong leadership at the top of the company—and those leaders have to be careful if their performance is judged by a horde of impatient investors.⁹

THROUGHPUT AS A NONFINANCIAL PERFORMANCE MEASURE

throughput

One nonfinancial performance indicator that is becoming widely accepted is **throughput**, which refers to the number of good units or quantity of services that are produced and sold by an organization within a specified time. An important aspect of this definition is that the company must sell the units and not simply

⁹ Robert W. Hall, *Attaining Manufacturing Excellence* (Homewood, Ill.: Dow Jones-Irwin, 1987), pp. 43–44.

	QUALITATIVE		QUANTITATIVE	
			Nonfinancial	Financial
PERSONNEL	Acceptance of additional responsibility Increased job skills Need for supervision Interaction with upper- and lower-level employees		Proportion of direct to indirect labor (low or high depending on degree of automation) Diversity of ethnic background in hiring and promotion Hours of continuing professional education Scores on standardized examinations	Comparability of personnel pay levels with those of competitors Savings from using part-time personnel
MARKET	Addition of new product features Increased product durability Improved efficiency of product Improved effectiveness of product		Number of sales transactions Number of repeat customers Generation of new ideas Number of customer complaints Number of days to deliver an order Proportion of repeat business Number of new patents obtained Number of new (lost) customers	Increase in revenue from previous period Percent of total market revenue Revenue generated per advertising dollar (by product or product line)
COSTS	Better traceability of costs Increased cost consciousness Better employee suggestions for cost reductions Increased usage of automated equipment for routine tasks		Time to design new products Number of engineering change orders issued for new (old) products Proportion of product defects Number of different product parts Number of days of inventory in stock Length of process time Proportion of material generated as scrap/waste Reduction in setup time since prior period	Reduction in production cost since prior period—individually for material, labor, and overhead, and collectively Reduction in distribution and scrap/waste cost since prior period Cost of engineering changes Variances from standard
RETURNS (PROFITABILITY)	Customer satisfaction Product brand loyalty		Proportion of on-time deliveries Degree of accuracy in sales forecasts of demand Frequency of customer willingness to accept an exchange rather than a refund	Increase in market price per share Return on investment Increase in net income Increase in cash flow

EXHIBIT 20-5

Examples of Performance Measurements

produce them for inventory. Because a primary goal of a profit-oriented organization is to make money, inventory must be sold for that goal to be achieved.

Management should strive to increase throughput both in terms of time and quality. Some benefits of improved throughput are increasing the ability to respond better to customer needs and demands, to reduce production costs, and to reduce inventory levels and, therefore, the non-value added costs of moving and storing goods.

Throughput can be analyzed as a set of component elements (in a manner similar to which the Du Pont model, presented in Chapter 19, includes components of return on investment). Components of throughput include manufacturing

cycle efficiency, process productivity, and process quality yield.¹⁰ Throughput can be measured as follows:

$$\begin{aligned} & \text{Manufacturing cycle efficiency} \times \text{Process productivity} \times \text{Process quality yield} = \text{Throughput} \\ & \frac{\text{Value-added processing time}}{\text{Total time}} \times \frac{\text{Total units}}{\text{Value-added processing time}} \times \frac{\text{Good units}}{\text{Total units}} = \frac{\text{Good units}}{\text{Total time}} \end{aligned}$$

Manufacturing cycle efficiency (as defined in Chapter 4) is the proportion of value-added processing time to total processing time. Value-added processing time reflects activities that increase the product's worth to the customer. For example, assume that Melbourne Manufacturing worked a total of 20,000 hours in May 2001 producing 25,000 tons of fertilizer. Of these hours, only 5,000 were considered value added; thus, the company had a manufacturing cycle efficiency of 25 percent.

process productivity

Total units started during the period divided by the value-added processing time determines **process productivity**. Melbourne Manufacturing produced 25,000 tons in May's 5,000 hours of value-added processing time and all units were sold. Thus, the company had a productivity rate of 5 (meaning that 5 tons could be produced in each value-added processing hour).

process quality yield

Production activities may produce both good and defective units. The proportion of good units resulting from activities is the **process quality yield**. Only 22,000 of the 25,000 tons produced by Melbourne Manufacturing in May were good tons; the defect was caused by an ingredients mixing problem. Thus, the company had an 88 percent process quality yield for the period.

The total product throughput of Melbourne Manufacturing in May was 1.1 ($0.25 \times 5 \times 0.88$); that is, the company produced and sold only 1.1 good tons for every hour of actual processing time. This result is significantly different from the 5 tons indicated as process productivity.

A company can increase throughput by decreasing non-value-added activities, increasing total unit production and sales, decreasing the per-unit processing time, or increasing the process quality yield. Throughput has been increased significantly in some companies through the use of flexible manufacturing systems. Computer technologies such as bar coding, computer-integrated manufacturing, and electronic data interchange have also enhanced throughput at many firms. Merely reorganizing the assembly operations can sometimes yield greater throughput.

ACTIVITY-BASED MANAGEMENT AND PERFORMANCE EVALUATION

7

How can activity-based management be used in long-run performance evaluation?

Traditional accounting performance measurements often use factors that contribute to non-value-added activities. Materials standards are developed that include waste allowances, and labor standards are developed that include idle time allowances. Predetermined overhead rates are set using expected annual capacity rather than full capacity. Inventories are produced to meet budget expectations rather than sales demand. There are detailed methods for accounting for spoiled and defective units (under the presumption that these will be incurred). Exhibit 20-6 provides some traditional performance indicators and potential suboptimizing results they may create.

¹⁰ These terms and formulas are based on the following article: Carole Cheatham, "Measuring and Improving Throughput," *Journal of Accountancy* (March 1990), pp. 89-91. One assumption that must be made with regard to this model is that the quantity labeled "throughput" is sold. Another assumption is that the units started are always completed before the end of the measurement period.

EXHIBIT 20-6*Traditional Performance Measurements and Suboptimized Results*

Measurement	Action	Result
Purchase price variance	Purchasing agent buys more than needed to get lower price or buys lower quality or ignores delivery speed and accuracy	Excess inventory; increased carrying cost; use of suppliers who may not have the best quality and/or delivery options
Machine utilization percentage or use of an overhead rate based on expected capacity	Supervisor produces more than needed to increase the utilization rate	Excess inventory; increased carrying cost; wrong inventory; lack of time for machine maintenance or worker training
Waste/idle time built into standard cost	Supervisor takes no action if the lax standard for material or labor is met	Inflated standard cost (thus, possibly, inflated selling price or misinformation about product profitability); acceptance and encouragement of less-than-the-best efforts
Cost center reporting	Managers focus on costs instead of activities	Cost reduction opportunities may be missed if costs are within budget; may not be able to determine if the cost center is operating efficiently

To adapt the traditional perspective, some companies are implementing activity-based management (ABM) and activity-based costing (ABC) techniques. ABM is concerned with increasing throughput by reducing non-value-added activities; ABC is concerned with long-run, rather than short-run, cost measurement. ABM and ABC can provide information on the overhead impact created by reengineered processes to streamline activities and minimize nonquality work. As quality improves, management's threshold of "acceptable" performance becomes more demanding and performance is evaluated against progressively more rigorous benchmarks.

World-class companies have begun to adopt ABM so as to remove any implied acceptance of non-value-added (NVA) activities from performance measurements or, if that is impossible, to design performance measurements that highlight those activities. The adages "you get what you measure" and "measure what you want to get" are appropriate. Activity-based management paired with a good pay-for-performance system encourages workers to develop new skills, accept greater responsibilities, and make suggestions for improvements in plant layout, product design, and worker utilization. Such improvements will reduce non-value-added time and cost. In addition, by focusing on activities and costs, ABM is better able to provide more appropriate measures of performance than are found in most traditional systems.

Performance measurements should concentrate on things that create customer value. Measures can be quantitative or qualitative, nonfinancial or financial. Measurement selection should be related to the performance that management wishes to either encourage or discourage. Probably the two most important performance measures of U.S. businesses at this time are quality and service.

Companies that are concerned about the cost of quality (COQ) and the non-value-added activities associated with lack of quality should develop COQ measurements such as those presented in Exhibit 20-7. For example, if a performance measurement is the cost of defective units produced during a period, the expectation is that defects will occur and management will accept some stated or understood

EXHIBIT 20-7

Cost of Quality Measurements

Element of COQ	Operational Cost Drivers	Measure	VA or NVA
Prevention	Investment in reducing overall COQ operations	$\frac{\text{Prevention Cost}^*}{\text{Total COQ}}$	VA
Appraisal	Setup frequency Tight tolerance operations Complex design	Number of inspections	NVA
Internal failure	Machine reliability Tooling age or condition Design error Operator error	Number of pieces rejected	NVA
External failure	Order entry errors Incorrect assembly instructions Product failure Operator error	Number of customer complaints	NVA

*Ideally, the formula should equal 1. Prevention costs are, by definition, all value-added costs. As non-value-added costs included in the denominator are eliminated, total COQ is composed of only value-added costs. Therefore, the formula ideally ends up equaling 1 (value-added costs ÷ value-added costs), which is the target measurement.

SOURCE: Michael R. Ostrenga, "Return on Investment Through the Cost of Quality," *Journal of Cost Management* (Summer 1991), p. 43. © 1991 Warren Gorham & Lamont. Reprinted with permission of RIA.

defect cost. If, instead, the performance measurement is zero defects, the expectation is that no defects will occur. This second measurement would create an atmosphere more conducive to eliminating defects than would the first one.

A commitment to quality requires that a company make major adjustments in the way it designs products, trains and develops its workforce, makes decisions on asset acquisition and utilization, and interacts with suppliers and customers. Products should be designed to provide the maximum quality possible for the forecasted selling price. Spoilage and defects should not be built into product or service costs. ABM, with its focus on value-added and non-value-added activities, helps to eliminate building such costs into a product.

One nonfinancial measure of service is how quickly customers receive their goods or lead time. Measuring lead time should cause products to be available to customers more rapidly. In addition, using fewer parts, interchangeable parts, and parts that require few or no engineering changes after the start of production will shorten lead time. Lead time measurement could also provide an incentive to revise a building layout so that work flow is quicker, to increase workforce productivity, and to reduce defects and reworks. Last, lead time measurement should cause managers to observe and correct any non-value-added activities or constraints that are creating production, performance, or processing delays.

Some performance measurements, such as zero defects and lead time, are important regardless of where a company or division is located. However, foreign operations may require some additional considerations in performance measurement and evaluation than do domestic operations.

PERFORMANCE EVALUATION IN MULTINATIONAL SETTINGS

Many large, decentralized companies have overseas operations whose performance must be measured and evaluated. Unfortunately, regardless of the location of these subunits, management often uses income as the overriding performance criterion.

Such a singular focus is usually not appropriate for domestic responsibility centers; it is even less appropriate for multinational segments. This conclusion is valid regardless of whether the organization is Dell Computer Corporation headquarters in Austin, Texas, with manufacturing operations in Ireland and Malaysia or WMC domiciled in Australia with operations in Singapore, Rotterdam, Kazakhstan, Canada, and the United States.

Differences among cultures and economies are as important as differences in accounting standards and reporting practices when attempting comparisons of multinational organizational units. In Japan, for instance, a company president views shareholders as basically inconsequential. When the head of a large Japanese conglomerate was asked “whether stock-market movements would ever affect his business decisions, he answered in a single word: ‘Never!’”¹¹ This type of attitude has allowed Japanese companies to focus on both long-run and short-run business decisions. Such a concept is relatively unheard of in the United States where top management is often removed by stockholders for making decisions that appear not to maximize current shareholder value.

The investment cost necessary to create the same type of organizational unit in different countries may differ substantially. For example, because of the exchange rate and legal costs, it is significantly more expensive for a U.S. company to open a Japanese subsidiary than an Indonesian one. If performance were measured using residual income calculated with the same target rate of return, the Japanese unit would be placed at a distinct disadvantage because of its larger investment base. However, the company may have believed that the possibility of future joint ventures with the Japanese was a primary corporate goal that justified the larger investment. One method of handling such a discrepancy in investment bases is to assign a lower target rate to compute residual income for the Japanese subsidiary than for the Indonesian one. This type of differential would also be considered appropriate because of the lower political, financial, and economic risks.

Income comparisons between multinational units may be invalid because of important differences in trade tariffs, income tax rates, currency fluctuations, and the possibility of restrictions on the transfer of goods or currency from a country. Income earned by a multinational unit may also be affected by conditions totally outside its control, such as protectionism of local companies, government aid, or varying wage rates caused by differing standards of living, level of industrial development, and/or the quantity of socialized services. If the multinational subunit adopts the local country’s accounting practices, differences in international standards can make income comparisons among units difficult and inconvenient even after the statements are translated to a single currency basis.

The diverse economic, legal/political, and tax structures of countries have affected the development and practice of accounting. Although the International Accounting Standards Committee is working to achieve harmonization of accounting standards, many of this organization’s standards reflect compromise positions, allow for a significant number of alternatives, and are accepted only through voluntary compliance. In addition, within the constraints of legal, moral, and social responsibility, managers may be able to transfer goods between segments at prices that minimize profits or tariffs in locations where taxes are high by shifting profits or cost values to more advantageous climates.

U.S. firms that have multinational profit or investment centers (or subsidiaries) need to establish flexible systems of measuring profit performance for those units. Such systems should recognize that differences in sales volumes, accounting standards, economic conditions, and risk might be outside the control of an international subunit’s manager. In such cases, qualitative performance measures may become significantly more useful. Performance evaluations can include factors such as market share increases, quality improvements (defect reductions), improvement

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What difficulties are encountered in trying to measure performance for multinational firms?

<http://www.dell.com>

¹¹ Alan S. Blinder, “Doing It Their Way,” *Business Edge* (October 1992), p. 27.

When piloting a plane, information from multiple instruments is necessary for flight safety. In the same manner, the balanced scorecard provides information about a variety of organizational activities that are crucial to business operations and success.



of inventory management with the related reduction in working capital, and new product development. Use of measures that limit suboptimization of resources is vital to the proper management of both domestic and multinational responsibility centers.

USING A BALANCED SCORECARD FOR MEASURING PERFORMANCE

9

How can a balanced scorecard be used to measure performance?

As mentioned in Chapter 19, an organization seeking an effective, integrated performance measurement system might choose to adopt a balanced scorecard approach. A balanced scorecard was originally developed to provide top managers with a set of measures that give

*a fast but comprehensive view of the business. The balanced scorecard includes financial measures that tell the results of actions already taken. And it complements the financial measures with operational measures on customer satisfaction, internal processes, and the organization's innovation and improvement activities—operational measures that are the drivers of future financial performance.*¹²

Since Kaplan and Norton first introduced the scorecard in the early 1990s, its use in some organizations is now at multiple levels: top management, subunit, and even individual employees. Additionally, as indicated in the News Note (page 916), the scorecard can be used by not-for-profit organizations as well. Regardless of the level of use, the scorecard approach directly links its measurements to the organization's strategies and values. Exhibit 20–8 provides an alternative balanced scorecard to the one presented in Chapter 19. Both scorecards, however, allow measurement data to be disaggregated into four segments that reflect past performance and provide indicators of investments in future performance. “Taken together, the measures provide a holistic view of what is happening both inside and outside the

¹² Robert S. Kaplan and David P. Norton, “The Balanced Scorecard—Measures That Drive Performance,” *Harvard Business Review* (January–February 1992), p. 71.

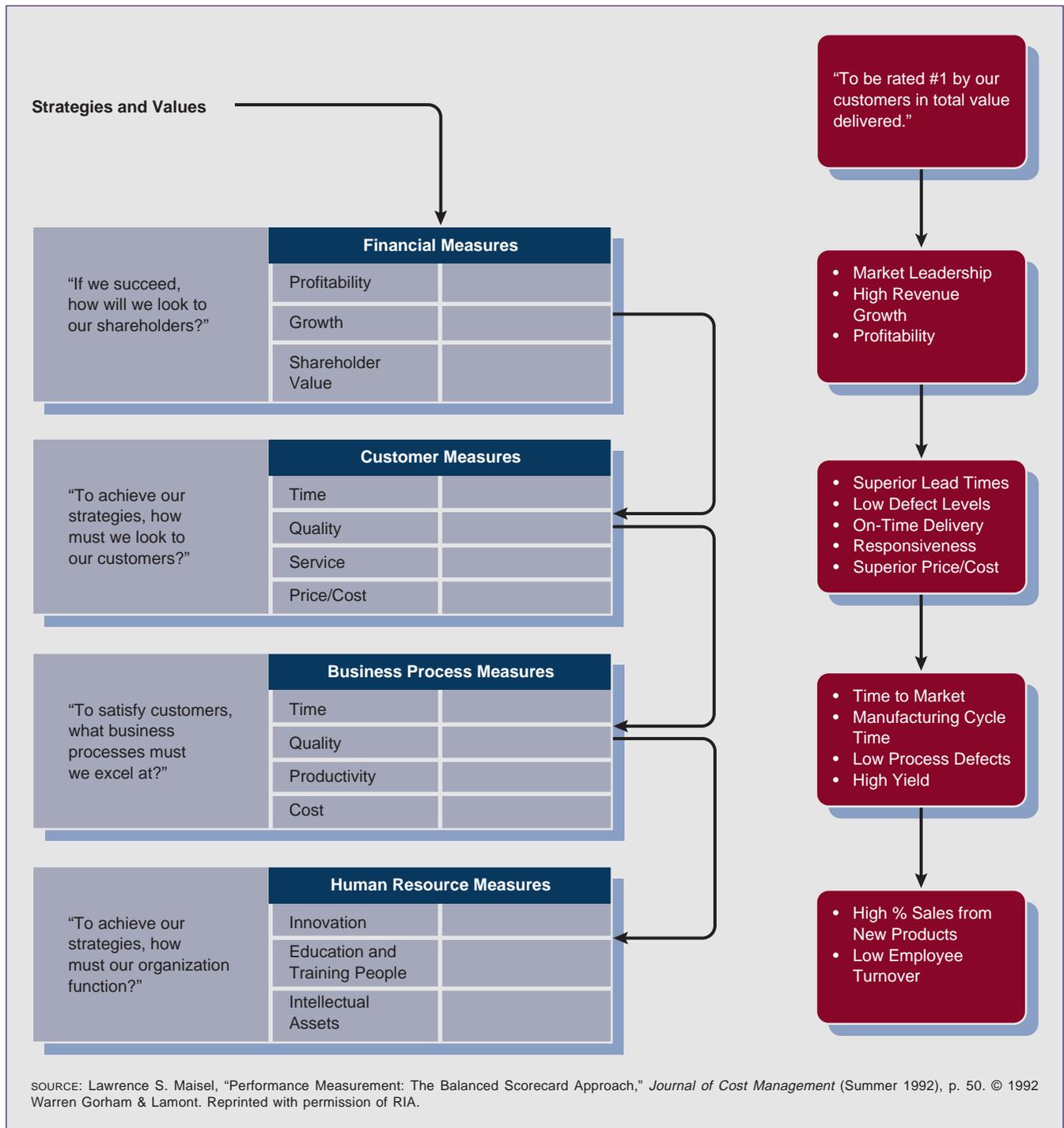


EXHIBIT 20-8

*Performance Measurement
Balanced Scorecard*

organization or level, thus allowing all constituents of the organization to see how their activities contribute to attainment of the organization's overall mission."¹³

The financial measures of the balanced scorecard should be designed to reflect shareholder-relevant issues of profitability and organizational growth. Such measures can include subunit operating income, bottom-line net income, cash flow, change in market share, and return on assets. Although these measures indicate

¹³ Chee W. Chow *et al.*, "The Balanced Scorecard: A Potent Tool for Energizing and Focusing Healthcare Organization Management," *Journal of Healthcare Management* (May-June 1998), pp. 263-280.

NEWS NOTE



GENERAL BUSINESS

Balancing the City

For more than 25 years, Charlotte, N.C., measured government efficiency and effectiveness by setting objectives and tracking performance against them. Although the method served the city well, it focused primarily on the past. Therefore, the city began searching for a performance measurement system that emphasized strategic planning for the future.

In the early '90s the city manager researched the "Balanced Scorecard," [and] Charlotte adapted the model to apply to the public sector, becoming the first U.S. city to do so.

The Balanced Scorecard promotes the establishment of tangible objectives and measures that relate to an or-

ganization's mission, vision and strategy. It focuses on four critical success indicators: customer service, financial accountability, internal work efficiencies, and learning and growth. Priorities are set within the major categories, first at the corporate level and then at division, department, team and even individual levels.

In 1990, Charlotte City Council chose five areas, community safety, transportation, economic development, neighborhoods and restructuring government, on which to focus its strategic plan. Those priorities were later modeled (as shown in the following table), representing the "corporate" level of the city's scorecard.

Charlotte's Corporate Scorecard

Customer perspective	Reduce crime	Increase perception of safety	Strengthen neighborhoods	Improve service quality	Provide safe, convenient transportation	Maintain competitive tax rates	Promote economic opportunity
Financial accountability perspective		Maximize benefit/cost	Expand non-city funding	Grow the tax base	Maintain AAA rating		
Internal process perspective	Increase positive contacts	Promote community-based problem solving	Secure funding/service partners	Improve productivity	Streamline customer interactions	Increase infrastructure capacity	Promote business mix
Learning and growth perspective		Enhance knowledge management capabilities	Close the skills gap	Achieve positive employee climate			

The Balanced Scorecard emphasizes strategic processes over routine processes. In Charlotte, the council's scorecard does not and cannot include every important service delivered. Instead, the scorecard reflects the processes that must improve in order for the council to meet its strategic goals.

In late 1996, after Charlotte's council had established the city's "corporate" scorecard, the process was repeated by the planning, transportation, engineering and property management, and police departments. Department-level objectives were matched with council-level objectives to ensure that the city would achieve its highest priorities.

By 1998, all of the city's departments had scorecards, but the measurement system will not become a routine part of the city's business until 2001. The concept of having only a few performance indicators has been troublesome since previously there were unlimited measures. However, with the council's support and the participation of the departments, the city has been able to clarify its critical objectives, identify the processes necessary to meet them and produce a concise model to assist officials in tracking the city's progress.

SOURCE: Pamela Syfert, Nancy Elliott, and Lisa Schumacher, "Charlotte Adapts the 'Balanced Scorecard,'" *The American City & County* (October 1998), p. 32ff.

past performance, "the hard truth is that if improved performance fails to be reflected in the bottom line, executives should reexamine the basic assumptions of their strategy and mission."¹⁴

¹⁴ Kaplan and Norton, "The Balanced Scorecard," p. 77.

Balanced scorecard measures of the customer perspective should indicate how the organization is faring relative to customer issues of speed (lead time), quality, service, and price (both purchase and after-purchase). These measures can be internal or external and should help an organization assess its future success in the eyes of its customers.

Business process measures should focus on the internal things that the organization needs to do to make certain that it is meeting customers needs and expectations. For example, for customers to judge an organization’s products or services as “high quality,” that organization must have internal processes that have high process yields by not producing or providing defective goods or services. Other measures in this area include manufacturing or service cycle efficiency, time-to-market on new products, on-time delivery, and cost variances (assuming that the costing system has been designed to determine the most realistic costs).

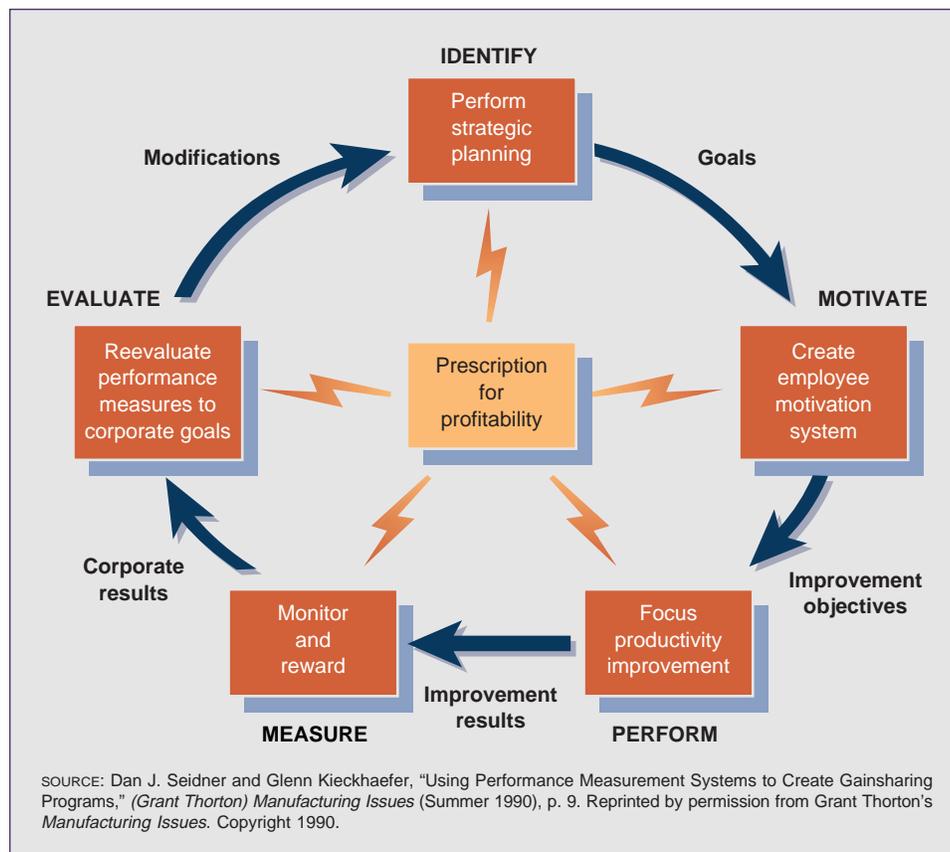
The final category of the scorecard should indicate those measures that the organization can use to help judge continuous improvement and predict longevity. These measures focus on using the organization’s intellectual capital to adapt to changing customer needs or influence new customer needs and expectations through product or service innovations. Measures such as number of patents or copyrights applied for, percentage of research and development projects resulting in patentable products, average time of R&D project from conception to commercialization, and percentage of capital investments on “high-tech” projects can help an organization ascertain its ability to learn, grow, improve—and, thus, survive.

Regardless of whether organizational management decides to use a balanced scorecard approach to performance measurement, some method of assessing performance must be developed. A variety of decisions must be integrated into a **performance management system** (depicted in Exhibit 20–9). This system reflects the entire package of decisions regarding performance measurement and evaluation.

performance management system

EXHIBIT 20-9

Performance Management System



The cycle of maintaining this system should be a continuous process. When employees meet performance objectives, rewards follow, and organizational results such as growth in market share, faster throughput, and higher profits can be expected. Reevaluating the performance measurement links to the satisfaction of organizational goals completes the cycle so that it may start anew.

No single system is appropriate for all organizations or, possibly, even all responsibility centers within the same company. The measurement of performance is the measurement of people. Because people are unique and have multiple facets, the performance management system must reflect those characteristics.

REVISITING

WMC Limited

<http://www.wmc.com.au>

Because of the importance that WMC Limited has placed on the environment, the company has separate vision and mission statements for this factor. The vision statement is “Employee pride and community respect for our environmental performance in managing resources for the future.” The 1998 mission statement was: “Within five years develop a WMC employee and contractor culture that ensures continual improvement in environmental performance, manages the environmental risks and improves shareholder value while considering customer and community expectations.”

The company’s environmental plan links environmental management with business planning, so that environmental considerations are seen as a usual part of doing business and making business decisions. To support this, the company has established eight environmental plan objectives related to systems, eight related to people, and six related to performance. Targets have been established for and are measured against the objectives.

But, more importantly, WMC Limited management understands that these measurements are critical to the

company’s long-run success. Thus, WMC issues an environmental performance report in conjunction with its annual financial report. These reports include nonfinancial measurements of eco-efficiency, management environmental performance, and noncompliance incidents. All stakeholders can review this pertinent nonfinancial information about the achievement of or progress toward environmental targets and commitments. Financial information about capital and operating expenditures related to environmental control and protection is also included.

To an Australian minerals company, sound environmental performance is essential to being welcome to operate in foreign countries in the process of exploration and development. To indicate its commitment to such performance, WMC believes that its measurement of environmental accomplishments should not just be for internal use. Given the breadth and depth of its environmental measurement and reporting activities, WMC Limited should be considered as world-class in this area and be used as a benchmark for activities of other companies.

SOURCE: WMC Limited, *Environmental Progress Report 1998*.

CHAPTER SUMMARY

A firm’s long-term objectives are always associated with investments and proactive efforts to enhance the company’s long-run competitive position. Long-term performance measures should be designed within the firm’s vision and mission statements and should assess progress toward goals and objectives. Managers should assure themselves that the persons being evaluated have the appropriate skills, equipment, information, and authority for accomplishment. Moreover, feedback on progress toward accomplishment should be provided in a timely and useful manner. Using

multiple measures regarding the firm's critical success factors is more effective than using a single measure.

One useful nonfinancial measure of performance is throughput. Throughput refers to the goods or services started, completed, and sold by an organization. When throughput is increased, the company goal of making money is enhanced. Activity-based management also provides an excellent base from which to identify long-term performance measurements.

Performance measures of multinational units may be more difficult to establish than those of domestic units because of differences in taxes, tariffs, currency exchange rates, and transfer restrictions. Top management may wish to consider extending the use of qualitative performance measures because of such differences.

A balanced scorecard can help an organization assess its performance through the use of financial and nonfinancial as well as internal and external measurements. The four areas of the scorecard (financial, customer, business processes, and human resource or innovation and growth) reflect the dissimilar activities in which an organization must engage to prosper and survive.

APPENDIX 1

Developing Comprehensive Performance Indicators

The following discussion is from Management Accounting Guideline 31, published by The Society of Management Accountants of Canada.¹⁵ It provides a framework for developing a comprehensive performance measurement or indicator system.

Firms need a performance indicator system that focuses externally on the business environment and its changing demands and on market/customers and competitors as well as internally on key nonfinancial indicators (such as market penetration, customer satisfaction, quality, delivery, flexibility, and value). These measures should be used in addition to the more traditional financial measures of sales growth, profits, return on investment, and cash flows.

Performance indicators should have five dimensions: output or results information, input information, process information, quality assessment, and efficiency or productivity information. Although these indicators will vary based on the firm's needs, they are likely to include environmental, market/customer, competitor, internal business processes, human resource, and financial measures.

The following steps are necessary to effectively implement new performance indicators:

1. Recognize the need for enhanced performance indicators by identifying new critical success factors (such as changes in customer behavior patterns).
2. Ensure top management support and commitment by underlining the need for change and by involving top management in steering committees to oversee the new system's development and refinement.
3. Create an implementation team to develop a common understanding of the firm's strategies, goals, and objectives; identify obstacles to implementation; and structure the approach. Input from all functions and levels of the firm as well as customers is helpful.
4. Develop a business performance model that can put the goals, strategies, objectives, critical success factors, and performance indicators into context by viewing the firm as one stage in a value chain of suppliers, the firm, markets, and customers.

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(Appendix 1) What steps need to be taken to implement a new performance measurement system?

¹⁵ Society of Management Accountants of Canada, "Management Accounting Guideline 31: Developing Comprehensive Performance Indicators," *CMA Magazine* (March 1997), p. 39. Reprinted from an article appearing in *CMA Management* (formerly *CMA Magazine*) from Management Accounting Guideline 31, with permission of CMA Canada.

5. Understand the firm's goals and strategies by subdividing them into environment, markets and customers, products and lines, technology, operations, finance, and organization/management issues.
6. Define the firm's critical success factors.
7. Assess the current performance measurement system relative to current needs, the business model, and the firm's goals, strategies, and critical success factors.
8. Determine which current measures should be eliminated: those that are redundant or overlapping and those that do not support the critical success factors.
9. Develop the performance indicator structure by consulting with different levels of management to determine what information should be tracked, how it should be tracked, how often it should be tracked, and how it will be used.
10. Establish the underlying technology (software, hardware, and telecommunications) necessary for the performance indicator system. Consider the information that is to be provided, its degree of detail, its frequency, its source, and the amount of data manipulation to occur.
11. Reevaluate the performance evaluation and reward systems to ensure that they are consistent with the new measurement system.
12. Ensure continual improvement by updating the system to reflect changes in the firm and in its external environment.

The challenge is to implement new performance measures that will contribute to the firm's success in an ever-changing business environment. Included among these challenges are:

- developing an awareness of a need for modifications;
- obtaining top management support and commitment as well as cross-functional support;
- obtaining the necessary resources to design and develop the performance indicator system;
- assuring accurate, timely, and useful data;
- linking new indicators to long-term economic value; and
- assessing the effects of the new system.

APPENDIX 2

11

(Appendix 2) What are some major areas of a manufacturing company for which performance measures and their cost drivers have been delineated?

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Performance Measurement Areas and Cost Drivers

Exhibit 20–10 is from a joint study by the Institute of Management Accountants (formerly the National Association of Accountants) and the international public accounting firm of Coopers & Lybrand LLP (now PricewaterhouseCoopers LLP). The exhibit indicates some activity cost drivers that need to be measured to determine performance in the six specified areas.

KEY TERMS

mission statement (p. 900)
 performance management system
 (p. 917)
 process productivity (p. 910)

process quality yield (p. 910)
 throughput (p. 908)
 values statement (p. 900)
 vision statement (p. 899)

EXHIBIT 20-10

Performance Measures

PERFORMANCE MEASUREMENT AREA: DESIGN FOR MANUFACTURABILITY

Key Characteristics	Cost Drivers/Measures
Quantity and quality of engineering changes	Number of engineering changes Severity of engineering changes
Test results	First pass reject rate Materials used versus design specification Manufacturing skills required
Parts standardization	Number of products Percent common parts per product
Engineering cycle time	Lead time to engineer (design) a finished product Startup time from design to production
Product complexity	Number of components per finished product Number of manufacturing operations per finished product Number of tools required per finished product

PERFORMANCE MEASUREMENT AREA: ZERO DEFECTS

Key Characteristics	Cost Drivers/Measure
Product specification	Tolerances of critical components Historical capability of process versus current performance
Parts quality	First pass reject rate versus test results Units scrapped by cell Cell downtime due to quality problems Yield of finished product per raw material batch Units reworked by cell
Quality control checkpoints	Sampling requirements for incoming materials Time required for sample/test procedures Production time loss due to quality control procedures/queues Number of checkpoints Effectiveness—number of returned units

PERFORMANCE MEASUREMENT AREA: MINIMIZE RAW AND IN PROCESS INVENTORY

Key Characteristics	Cost Drivers/Measures
Supplier performance	Number and location of vendors Number/frequency of deliveries Lead time from order initiation to delivery Flexibility in order quantity, delivery and variety
Components standardization	Complexity of components Number of components to support total production
Market characteristics	Demand variation Forecast accuracy Availability/accuracy of information

PERFORMANCE MEASUREMENT AREA: ZERO LEAD TIME

Key Characteristics	Cost Drivers/Measures
Velocity of units through cell	Actual production time Queue time between operations Move, setup, and inspection times Manufacturing cycle efficiency = value-added time ÷ total time
Quality of components	Scrap percent Rework percent Yield percent
Customer service levels	Late deliveries On-time deliveries Back orders Cancelled orders
Complexity of flow	Mix of products New product introductions Routing required per product

(continued)

EXHIBIT 20-10

(Concluded)

PERFORMANCE MEASUREMENT AREA: MINIMIZE PROCESS TIME	
Key Characteristics	Cost Drivers/Measures
Product design	Number of components
■ Complexity	Number of manufacturing procedures/steps
■ Tolerance	Required tolerance versus matching optimum
■ Materials	Maximum tolerance range per component
■ Producibility	Packaging of component versus use configuration
	Quality of components
	Availability/ease of use
	Skills necessary to meet engineering requirements
Process capabilities and limitations	Information system capabilities
	Plant layout: optimum versus current
	Work rules: percent changed
PERFORMANCE MEASUREMENT AREA: OPTIMIZE PRODUCTION	
Key Characteristics	Cost Drivers/Measures
Resource limitations	Bottleneck capacity level
	Setup time
	Lot size constraints
	Labor availability, qualifications, flexibility
	Material resources (e.g., availability, lead time, quality, proximity)
	Number of distribution centers
	Number of storerooms
Demand fluctuation	Volume variations (total units produced)
	Mix changes (number and magnitude)
	Schedule changes (number and magnitude)
Configuration of plant	Plant layout (e.g., move time, move distance, number of total moves)
Information processing constraints	Information accuracy and availability
	Data accuracy in planning (routing, bills, standards)

SOURCE: C. J. McNair, William Mosconi and Thomas Norris, *Meeting the Technology Challenge: Cost Accounting in a JIT Environment* (Montvale, N.J.: National Association of Accountants, now Institute of Management Accountants, 1988), pp. 199–210. Copyright by Institute of Management Accountants (formerly National Association of Accountants), Montvale, N.J.

SOLUTION STRATEGIES**Measuring Throughput**

$$\text{Manufacturing cycle efficiency} \times \text{Process productivity} \times \text{Process quality yield} = \text{Throughput}$$

$$\frac{\text{Value-added processing time}}{\text{Total time}} \times \frac{\text{Total units}}{\text{Value-added processing time}} \times \frac{\text{Good units}}{\text{Total units}} = \frac{\text{Good units}}{\text{Total time}}$$

DEMONSTRATION PROBLEM

Andrew Brown Company makes computer chips. During November 2001, managers compiled the following data:

Total chips processed	741,000
Good chips	703,950
Total hours	7,600
Value-added processing hours	2,660

Required:

- Calculate the manufacturing cycle efficiency.
- Calculate the process productivity.
- Calculate the process quality yield.
- Calculate the throughput using one ratio.
- Confirm your answer to part (d) using the results of parts (a), (b), and (c).

Solution to Demonstration Problem

- $\frac{\text{Value-added processing time}}{\text{Total time}} = \frac{2,660}{7,600} = 0.35$
- $\frac{\text{Total chips produced}}{\text{Value-added processing time}} = \frac{741,000}{2,660} = 279$ (rounded)
- $\frac{\text{Good chips}}{\text{Total chips produced}} = \frac{703,950}{741,000} = 0.95$
- $\frac{\text{Good chips}}{\text{Total time}} = \frac{703,950}{7,600} = 93$ (rounded)
- $(0.35 \times 279 \times 0.93) = 91$ chips per hour (rounded)

QUESTIONS

- What are the benefits of a vision and a values statement to the firm?
- How does a mission statement differ from a vision statement?
- How do long-run objectives differ from short-run objectives?
- Why does management need to focus on long-run performance?
- In what four categories can nonfinancial performance measures be classified? Why is each of these categories important?
- Why are qualitative measures sometimes difficult to use in evaluating performance?
- According to the NAA's (now IMA's) *Statement Number 4D*, what are the two distinct advantages of using nonfinancial performance measures?
- What advantages do nonfinancial performance measures have over financial performance measures?
- How does development of bases for comparison of performance measures assist managers?
- Once effectively designed, should a performance measurement system remain constant? Why or why not?
- Why is throughput defined on the basis of goods sold rather than goods produced?
- How can activity-based management concepts be used to design performance measures?
- What organizational changes might be implemented if lead time to customers is established as a high-priority performance measure?
- What difficulties are encountered in trying to measure performance for multinational firms?
- What is a balanced scorecard and what makes it balanced?

16. “Because of its inclusion of a financial perspective, a balanced scorecard can only be used for profit-oriented companies.” Is this statement true or false? Explain your answer.
17. (*Appendix 1*) Summarize the important points in the Society of Management Accountants of Canada’s framework for developing a comprehensive performance measurement system.

EXERCISES

18. (*Terminology*) Match the following lettered terms on the left with the appropriate numbered descriptions on the right.

<ol style="list-style-type: none"> a. Balanced scorecard b. Mission statement c. Performance management system d. Process productivity e. Process quality yield f. Throughput g. Values statement h. Vision statement i. None of the above 	<ol style="list-style-type: none"> 1. An expression of how a firm’s products or services meet customers’ needs 2. The package of decisions regarding performance measurement and evaluation 3. An expression of a future state that is better than present 4. An expression of organizational culture 5. Relationship between total units and value-added time 6. Number of good units produced and sold within a specified time period 7. An integrated business performance measurement model 8. All endeavors helping a firm to achieve its goals 9. Good units produced and sold relative to total units
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19. (*Vision statement*) The board of directors of your company has asked you to explain what a vision statement is and to devise several criteria that might be used in preparing a good vision statement. Write a brief report complying with the board’s request. In your report, also explain how a well-prepared vision statement will benefit the firm.
20. (*Organizational statements*) On the Internet, find an annual report for a company having vision, mission, and values statements. How do these three statements flow from one another? How do these three statements differ?
21. (*Time perspective*) Choose a company that has either gone out of business or is currently in very poor financial condition. Research that company to investigate its history. Prepare a report on your finding, concentrating on indicators that might have provided a perspective of failure. Describe these indicators as short term or long term.
22. (*Qualitative measures*) Prepare a discussion of how you would react to and behave if you were one of Ford’s top managers who was being graded on the curve. (See the chapter News Note.) Provide three perspectives, assuming you fell into each of the grade categories.
23. (*Nonfinancial performance measures*) One of the “old time” accountants in your company says that nonfinancial performance measures are not accounting and should be left for others to accumulate and evaluate. How would you respond?



24. (*Throughput*) Ben's Barn's makes pre-fab buildings and is examining its throughput. Analysis of May production revealed the following:

Good units produced and sold	12,000
Total units produced	16,000
Total processing time	288,000 hours
Value-added time	96,000 hours

- Determine the manufacturing cycle efficiency.
- Determine the process productivity.
- Determine the process quality yield.
- Determine the throughput.

25. (*Throughput*) Ishmal Cannery packs dates for worldwide shipment. The owner has asked you to analyze the cannery's throughput. You find that in June, the cannery generated the following:

Cans packed and shipped	30,000
Total cans (some defective)	37,500
Value-added processing time	12,500 hours
Total processing time	48,000 hours

- Calculate the manufacturing cycle efficiency.
- Calculate the process productivity.
- Calculate the process quality yield.
- Calculate the throughput using only good units and total time.
- Verify your answer to part (d) by using your answers to parts (a), (b), and (c).

26. (*Quality performance measures*) Birmingham Metalworks manufactures iron railings for ornamental fences. Recently, the company has become much more concerned about reducing the number of flaws in its completed products. Identify some performance measures that the company could use to monitor the effectiveness of its efforts to improve product quality.
27. (*ABM and long-run performance measurement*) A consultant has just recommended that activity-based management would help the company generate much of the information necessary for long-run performance measurements. Prepare a brief report for the CEO explaining some of the ways ABM would help in long-run measurement.

PROBLEMS

28. (*Organizational statements*) You and three friends have just started a company called "Hot Stuf" that produces hot sauce. You intend to sell your product through grocery stores and on the Internet. Before you begin hiring employees, you believe that the company needs mission, vision, and values statements. Prepare these statements for the company and provide the logic behind the statements.
29. (*Long-run performance*) As the new controller of your company, you have been asked by the company president to comment on any deficiencies of the firm. After saying you believe that the firm needs long-run performance measurements, the president says that the long run is really just a series of short runs. He says that if you do a good job of evaluating these short-run performances, that the long run will take care of itself. He sees that you are unconvinced and agrees to keep an open mind if you can make a good case for measuring and evaluating long-run performance. He suggests that you prepare a report stating your case.

30. (*Performance measures*) An article entitled “New Metrics for a New Age,” in the April 7, 1997 issue of *Forbes ASAP*, provided a wide variety of measurements that might help indicate corporate success.

- a. Assume that you are the CEO of a company and provide basic information about this company (type of company, product, customer base, market, etc.).
- b. Using the *Forbes ASAP* article as a base, select the 15 indicators that you believe would provide the best information to judge your company’s performance. Explain why you selected these particular indicators.



31. (*Throughput*) Historically, Kaleidoscope Corp. has evaluated divisional performance on financial measures. Top managers are now seeking alternative measures that more accurately assess success in the activities that generate customer value. One promising measure is throughput. Management has gathered the following information on one of its larger operating divisions:

Units started and completed	60,000
Total good units completed	39,000
Total value-added hours of processing time	24,000
Total hours of divisional time	36,000

- a. What is the division’s manufacturing cycle efficiency?
- b. What is the division’s process productivity?
- c. What is the division’s process quality yield?
- d. What is the total hourly throughput?
- e. What can Kaleidoscope Corp.’s management do to raise hourly throughput?



32. (*Throughput*) Maria Rocco is concerned about the quantity of goods being produced by the Latin American Division of AutoWorld. The following production data are available for April 2001:

Total units completed	60,000
Total good units completed	47,500
Total value-added hours of processing time	15,000
Total hours of division time	56,000

Determine each of the following for this division for April.

- a. What is the manufacturing cycle efficiency?
 - b. What is the process productivity?
 - c. What is the process quality yield?
 - d. What is the total throughput per hour?
 - e. If only 22,500 of the units produced in April had been sold, would your answers to any of the above questions differ? If so, how? If not, why not?
 - f. If Rocco can eliminate 20 percent of the non-value-added time, how would throughput per hour for these data differ?
 - g. If Rocco can increase quality output to a yield of 94 percent and eliminate 20 percent of the non-value-added time, how would throughput per hour for these data differ?
 - h. How would Rocco determine how the non-value-added time was being spent in the division? What suggestions do you have to decrease non-value-added time and increase yield?
33. (*Balanced scorecard*) You have been elected president of your university’s newly chartered accounting honor society. The society is a chapter of a national organization that has the following mission: “To promote the profession of accountancy as a career and to imbue members with high ethical standards.”
- a. Determine the balanced scorecard categories that you believe would be appropriate for the honor society.
 - b. Under each category, determine between four and six important performance measures.
 - c. How would you choose benchmarks against which to compare your chapters to others of the national organization?

REALITY CHECK

34. An article by Alan Owen, entitled “A Measure of Their Worth,” appeared in the July–August 1997 issue of *CMA Magazine*. This article discussed how BC Rail’s managers tied performance measures to the company’s strategic goals. Review this article and discuss the company’s performance for the years since this process was implemented.
35. (*Performance measures*) As the cost of health care continues to increase, hospital and clinic managers need to be able to evaluate the performance of their organizations. Numerous articles have been written on performance measurements in health care organizations. Obtain some of these articles and prepare a report on what you believe to be the best balanced scorecard set of measures for such an organization.
36. The following is a quote from Mindy Fried at the Center for Work and Family: “The research is pretty clear that as people work over a certain number of hours, productivity goes down, stress goes up, and work isn’t as good.” You have taken this quote to heart and want to establish some performance measures in your accounting firm to help indicate that there is a balance by employees between work and leisure. Use all resources available to research this topic and prepare your list of performance measures. How will you benchmark these measures? How will you react to employees who are “workaholics?”
37. *A few New Orleans hoteliers reneged on promises to set aside hotel rooms for the National Football League’s Super Bowl XXXI, a senior NFL executive and New Orleans tourism executives said. Tourism officials said they feared the conflict created ill will with the football league, which could make future Super Bowls more difficult to land.*
. . . According to Jim Steeg, director of special events for the NFL, several hoteliers decided to ignore the promise and sell about 400 [of approximately 15,000] rooms reserved for the NFL.
- SOURCE: Stewart Yerton, “Some Hotels Stiff NFL for Rooms,” (*New Orleans Times-Picayune* (September 4, 1996), p. C1. Permission granted by The Time-Picayune Publishing Corporation. All rights reserved. Reprinted with permission.
- Discuss the strategy of the hotels reneging on their promise to the NFL. Do you think that these hotels are considering the long-run implications of their actions?
 - Is it possible for a few hotels to hurt the larger community in which they operate? How or why?
 - Suggest an alternative strategy to the managers of these hotels.
38. Many companies are now preparing environmental, health, and safety reports for public review. Use the Internet to obtain one of these companies’ reports for two consecutive periods (or more, if available).
- What measures are being used to evaluate performance?
 - What targets have been set as comparison bases?
 - How well is the company performing?
 - Given the trend data available, do you think the company has set “stretch” targets or easily achievable targets? Discuss the rationale for your answer.

