



# Chapter One

# Measurement and Management in the Information Age

IMAGINE ENTERING THE COCKPIT of a modern jet airplane and seeing only a single instrument there. How would you feel about boarding the plane after the following conversation with the pilot?

Q: I'm surprised to see you operating the plane with only a single instrument. What does it measure?

A: Airspeed. I'm really working on airspeed this flight.

Q: That's good. Airspeed certainly seems important. But what about altitude. Wouldn't an altimeter be helpful?

A: I worked on altitude for the last few flights and I've gotten pretty good on it. Now I have to concentrate on proper air speed.

Q: But I notice you don't even have a fuel gauge. Wouldn't that be useful?

A: You're right; fuel is significant, but I can't concentrate on doing too many things well at the same time. So on this flight I'm focusing on air speed. Once I get to be excellent at air speed, as well as altitude, I intend to concentrate on fuel consumption on the next set of flights.

We suspect that you would not board the plane after this discussion. Even if the pilot did an exceptional job on air speed, you would be worried about colliding with tall mountains or running low on fuel. Clearly, such a conversation is a fantasy since no pilot would dream of

guiding a complex vehicle like a jet airplane through crowded air spaces, with only a single instrument. Skilled pilots are able to process information from a large number of indicators to navigate their aircraft. Yet navigating today's organizations through complex competitive environments is at least as complicated as flying a jet. Why should we believe that executives need anything less than a full battery of instrumentation for guiding their companies? Managers, like pilots, need instrumentation about many aspects of their environment and performance to monitor the journey toward excellent future outcomes.

The Balanced Scorecard (BSC) provides managers with the instrumentation they need to navigate to future competitive success. Today, organizations are competing in complex environments so that an accurate understanding of their goals and the methods for attaining those goals is vital. The Balanced Scorecard translates an organization's mission and strategy into a comprehensive set of performance measures that provides the framework for a strategic measurement and management system. The Balanced Scorecard retains an emphasis on achieving financial objectives, but also includes the performance drivers of these financial objectives. The scorecard measures organizational performance across four balanced perspectives: financial, customers, internal business processes, and learning and growth. The BSC enables companies to track financial results while simultaneously monitoring progress in building the capabilities and acquiring the intangible assets they need for future growth.

## COMPETING IN THE INFORMATION AGE

Companies are in the midst of a revolutionary transformation. Industrial age competition is shifting to information age competition. During the industrial age, from 1850 to about 1975, companies succeeded by how well they could capture the benefits from economies of scale and scope.<sup>1</sup> Technology mattered, but, ultimately, success accrued to companies that could embed the new technology into physical assets that offered efficient, mass production of standard products.

During the industrial age, financial control systems were developed in companies, such as General Motors, DuPont, Matsushita, and General Electric, to facilitate and monitor efficient allocations of financial and physical capital.<sup>2</sup> A summary financial measure such as return-on-capital-employed (ROCE) could both direct a company's internal capital to its most productive use and monitor the efficiency by which operating divisions used financial and physical capital to create value for shareholders.

The emergence of the information era, however, in the last decades of the twentieth century, made obsolete many of the fundamental assumptions of industrial age competition. No longer could companies gain sustainable competitive advantage by merely deploying new technology into physical assets rapidly, and by excellent management of financial assets and liabilities.

The impact of the information era is even more revolutionary for service organizations than for manufacturing companies. Many service organizations, especially those in the transportation, utility, communication, financial, and health care industries, existed for decades in comfortable, noncompetitive environments. They had little freedom in entering new businesses and in pricing their output. In return, government regulators protected these companies from potentially more efficient or more innovative competitors, and set prices at a level that provided adequate returns on their investment and cost

base. Clearly, the past two decades have witnessed major deregulatory and privatization initiatives for service companies throughout the world as information technology created the “seeds of destruction” of industrial-era regulated service companies.

The information age environment for both manufacturing and service organizations requires new capabilities for competitive success. The ability of a company to mobilize and exploit its tangible or invisible assets has become far more decisive than investing and managing physical, tangible assets.<sup>3</sup> Intangible assets enable an organization to:

- develop customer relationships that retain the loyalty of existing customers and enable new customer segments and market areas to be served effectively and efficiently;
- introduce innovative products and services desired by targeted customer segments;
- produce customized high-quality products and services at low cost and with short lead times;
- mobilize employee skills and motivation for continuous improvements in process capabilities, quality, and response times; and
- deploy information technology, data bases, and systems.

## ***New Operating Environment***

Information age organizations are built on a new set of operating assumptions.

### **CROSS-FUNCTIONS**

Industrial age organizations gained competitive advantage through specialization of functional skills: in manufacturing, purchasing, distribution, marketing, and technology. This specialization yielded substantial benefits, but, over time, maximization of functional specialization led to enormous inefficiencies, hand-offs between departments, and slow response processes. The information age organization operates with integrated business processes that cut across traditional business functions.<sup>4</sup> It combines the specialization benefits from functional expertise with the speed, efficiency, and quality of integrated business processes.

### **LINKS TO CUSTOMERS AND SUPPLIERS**

Industrial age companies worked with customers and suppliers through arm's-length transactions. Information technology enables today's organizations to integrate supply, production, and delivery processes so that operations are triggered by customer orders, not by production plans that push products and services through the value chain. An integrated system, from customer orders upstream to raw material suppliers, enables all organizational units along the value chain to realize enormous improvements in cost, quality, and response times.

## **CUSTOMER SEGMENTATION**

Industrial age companies prospered by offering low-cost but standardized products and services; recall Henry Ford's famous dictum, "They can have whatever color they want as long as it is black." Once consumers have satisfied their basic needs for clothing, shelter, food, and transportation, they want more individualized solutions to their wants. Information age companies must learn to offer customized products and services to its diverse customer segments, without paying the usual cost penalty for high-variety, low-volume operations.<sup>5</sup>

## **GLOBAL SCALE**

Domestic borders are no longer a barrier to competition from more efficient and responsive foreign companies. Information age companies compete against the best companies in the world. The large investments required for new products and services may require customers worldwide to provide adequate returns. Information age companies must combine the efficiencies and competitive honing of global operations with marketing sensitivity to local customers.

## **INNOVATION**

Product life cycles continue to shrink. Competitive advantage in one generation of a product's life is no guarantee of product leadership in the next technological platform.<sup>6</sup> Companies that compete in industries with rapid technological innovation must be masters at anticipating customers' future needs, devising radical new product and service offerings, and rapidly deploying new product technologies into efficient operating and service delivery processes. Even for companies in industries with relatively long product-life cycles, continuous improvement in processes and product capabilities is critical for long-term success.

## KNOWLEDGE WORKERS

Industrial age companies created sharp distinctions between two groups of employees. The intellectual elite—managers and engineers—used their analytical skills to design products and processes, select and manage customers, and supervise day-to-day operations. The second group was composed of the people who actually produced the products and delivered the services. This direct labor work force was a principal factor of production for industrial age companies, but used only their physical capabilities, not their minds. They performed tasks and processes under direct supervision of white-collar engineers and managers. At the end of the twentieth century, automation and productivity have reduced the percentage of people in the organization who perform traditional work functions, while competitive demands have increased the number of people performing analytic functions: engineering, marketing, management, and administration. Even individuals still involved in direct production and service delivery are valued for their suggestions on how to improve quality, reduce costs, and decrease cycle times. As the plant manager of a refurbished Ford engine plant declared, “The machines are designed to run automatically. The people’s job is to think, to problem solve, to ensure quality, not to watch the parts go by. Here, people are viewed as problem-solvers, not variable costs.”<sup>7</sup>

Now all employees must contribute value by what they know and by the information they can provide. Investing in, managing, and exploiting the knowledge of every employee have become critical to the success of information age companies.

As organizations attempt to transform themselves to compete successfully in the future, they are turning to a variety of improvement initiatives:

- Total quality management
- Just-in-time (JIT) production and distribution systems
- Time-based competition
- Lean production/lean enterprise

- Building customer-focused organizations
- Activity-based cost management
- Employee empowerment
- Reengineering

Each of these improvement programs has had demonstrated success stories, champions, gurus, and consultants. Each competes for the time, energy, and resources of senior executives. And each offers the promise of breakthrough performance and enhanced value creation for many, if not all, of a company's constituencies: shareholders, customers, suppliers, and employees. The goal of these programs is not incremental improvement or survival. The goal is discontinuous performance, enabling an organization to succeed in the new information age competition.

But many of these improvement programs have yielded disappointing results. The programs are often fragmented. They may not be linked to the organization's strategy, nor to achieving specific financial and economic outcomes. Breakthroughs in performance require major change, and that includes changes in the measurement and management systems used by an organization. Navigating to a more competitive, technological, and capability-driven future cannot be accomplished merely by monitoring and controlling financial measures of past performance.

## **TRADITIONAL FINANCIAL ACCOUNTING MODEL**

All the new programs, initiatives, and change management processes of information age companies are being implemented in an environment governed by quarterly and annual financial reports. The financial-reporting process remains anchored to an accounting model developed centuries ago for an environment of arm's-length transactions between independent entities. This venerable financial accounting model is still being used by information age companies as they attempt to build internal assets and capabilities, and to forge linkages and strategic alliances with external parties.<sup>8</sup>

Ideally, this financial accounting model should have been expanded to incorporate the valuation of a company's intangible and intellectual assets, such as high-quality products and services, motivated and skilled employees, responsive and predictable internal processes, and satisfied and loyal customers. Such a valuation of intangible assets and company capabilities would be especially helpful since, for information age companies, these assets are more critical to success than traditional physical and tangible assets. If intangible assets and company capabilities could be valued within the financial accounting model, organizations that enhanced these assets and capabilities could communicate this improvement to employees, shareholders, creditors, and communities. Conversely, when companies depleted their stock of intangible assets and capabilities, the negative effects could be reflected immediately in the income statement. Realistically, however, difficulties in placing a reliable financial value on such assets as the new product pipeline; process capabilities; employee skills, motivation, and flexibility; customer loyalty; data bases; and systems will likely preclude them from ever being recognized in organizational balance sheets. Yet these are the very assets and capabilities that are critical for success in today's and tomorrow's competitive environment.

## **THE BALANCED SCORECARD**

The collision between the irresistible force to build long-range competitive capabilities and the immovable object of the historical-cost financial accounting model has created a new synthesis: the Balanced Scorecard. The Balanced Scorecard retains traditional financial measures. But financial measures tell the story of past events, an adequate story for industrial age companies for which investments in long-term capabilities and customer relationships were not critical for success. These financial measures are inadequate, however, for guiding and evaluating the journey that information age companies must make to create future value through investment in customers, suppliers, employees, processes, technology, and innovation.

The Balanced Scorecard complements financial measures of past performance with measures of the drivers of future performance. The objectives and measures of the scorecard are derived from an organization's vision and strategy. The objectives and measures view organizational performance from four perspectives: financial, customer, internal business process, and learning and growth. These four perspectives provide the framework for the Balanced Scorecard (see Figure 1-1).

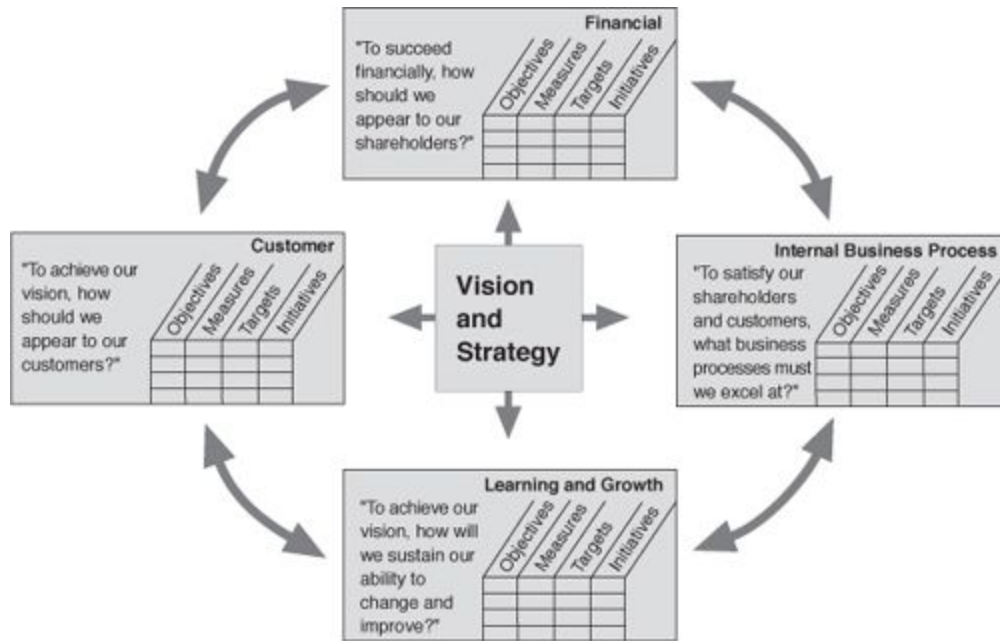
The Balanced Scorecard expands the set of business unit objectives beyond summary financial measures. Corporate executives can now measure how their business units create value for current and future customers and how they must enhance internal capabilities and the investment in people, systems, and procedures necessary to improve future performance. The Balanced Scorecard captures the critical value-creation activities created by skilled, motivated organizational participants. While retaining, via the financial perspective, an interest in short-term performance, the Balanced Scorecard clearly reveals the value drivers for superior long-term financial and competitive performance.

## ***The Balanced Scorecard as a Management System***

Many companies already have performance measurement systems that incorporate financial and nonfinancial measures. What is new about a call for a “balanced” set of measures? While virtually all organizations do indeed have financial and nonfinancial measures, many use their nonfinancial measures for local improvements, at their front-line and customer-facing operations. Aggregate financial measures are used by senior managers as if these measures could summarize adequately the results of operations performed by their lower and mid-level employees. These organizations are using their financial and nonfinancial performance measures only for tactical feedback and control of short-term operations.

The Balanced Scorecard emphasizes that financial and nonfinancial measures must be part of the information system for employees at all levels of the organization. Front-line employees must understand the financial consequences of their decisions and actions; senior executives must understand the drivers of long-term financial success. The objectives and the measures for the Balanced Scorecard are more than just a somewhat ad hoc collection of financial and nonfinancial performance measures; they are derived from a top-down process driven by the mission and strategy of the business unit. The Balanced Scorecard should translate a business unit’s mission and strategy into tangible objectives and measures. The measures represent a *balance* between external measures for shareholders and customers, and internal measures of critical business processes, innovation, and learning and growth. The measures are *balanced* between the outcome measures—the results from past efforts—and the measures that drive future performance. And the scorecard is *balanced* between objective, easily quantified outcome measures and subjective, somewhat judgmental, performance drivers of the outcome measures.

*Figure 1-1* The Balanced Scorecard Provides a Framework to Translate a Strategy into Operational Terms



Source: Robert S. Kaplan and David P. Norton, "Using the Balanced Scorecard as a Strategic Management System," *Harvard Business Review* (January–February 1996): 76. Reprinted with permission.

The Balanced Scorecard is more than a tactical or an operational measurement system. Innovative companies are using the scorecard as a *strategic management system*, to manage their strategy over their long run (see Figure 1-2). They are using the measurement focus of the scorecard to accomplish critical management processes:

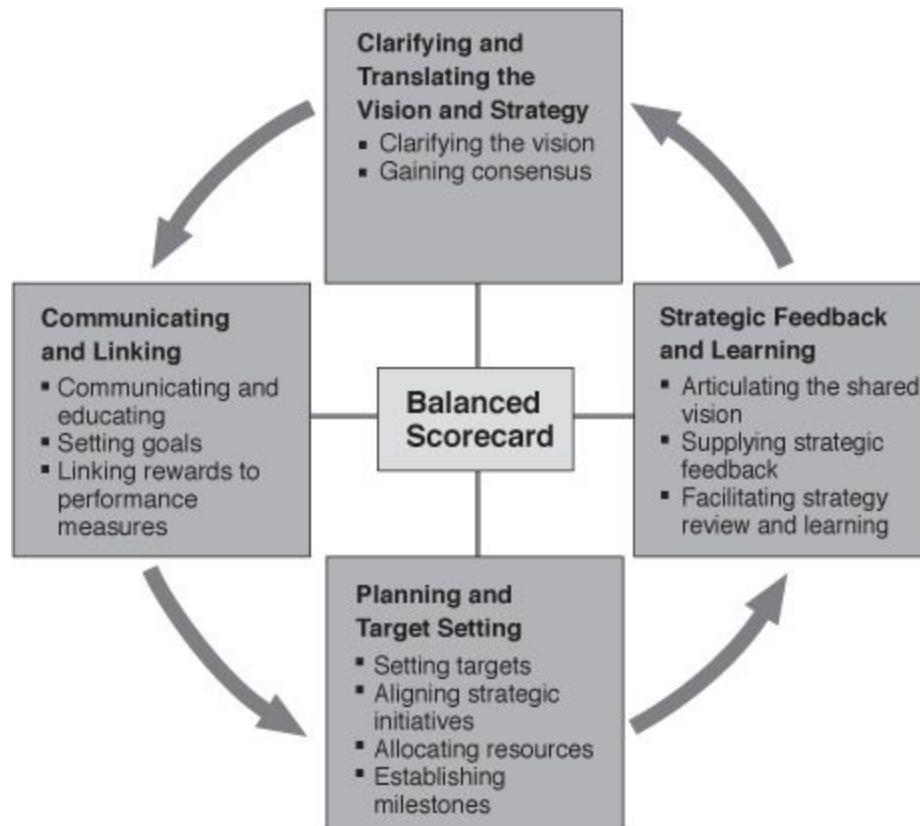
1. Clarify and translate vision and strategy
2. Communicate and link strategic objectives and measures
3. Plan, set targets, and align strategic initiatives
4. Enhance strategic feedback and learning

## CLARIFY AND TRANSLATE VISION AND STRATEGY

The scorecard process starts with the senior executive management team working together to translate its business unit's strategy into specific strategic objectives. To set financial goals, the team must consider whether to emphasize revenue and market growth, profitability, or cash flow generation. But especially for the customer perspective, the management team must be explicit about the customer and market segments in which it has decided to compete. For example, one financial institution thought its top 25 senior executives agreed about its strategy: to provide superior service to targeted customers. In formulating customer objectives for the scorecard, however, it became clear that each executive had a different definition as to what superior service represented and who were the targeted customers. The process of developing operational measures for the scorecard brought consensus among all 25 executives as to the most desirable customer segments, and the products and services the bank should offer to those targeted segments.

With financial and customer objectives established, an organization then identifies the objectives and measures for its internal business process. Such identification represents one of the principal innovations and benefits of the scorecard approach. Traditional performance measurement systems, even those that use many nonfinancial indicators, focus on improving the cost, quality, and cycle times of existing processes. The Balanced Scorecard highlights those processes that are most critical for achieving breakthrough performance for customers and shareholders. Often this identification reveals entirely new internal processes that the organization must excel at for its strategy to be successful.

*Figure 1-2 The Balanced Scorecard as a Strategic Framework for Action*



Source: Robert S. Kaplan and David P. Norton, "Using the Balanced Scorecard as a Strategic Management System," *Harvard Business Review* (January–February 1996): 77. Reprinted with permission.

The final linkage, to learning and growth objectives, reveals the rationale for significant investments in reskilling employees, in information technology and systems, and in enhanced organizational procedures. These investments—in people, systems, and procedures—generate major innovation and improvement for internal business processes, for customers, and, eventually, for shareholders.

The process of building a Balanced Scorecard clarifies the strategic objectives and identifies the critical few drivers of the strategic objectives. In our experience with the design of scorecard programs, we have never encountered a management team that had reached full consensus on the relative importance of its strategic objectives. In general, these are harmonious teams in well-managed organizations. The reason for the lack of consensus can usually be related to the functional history and culture of the organization. Executives tend to build careers within a single function. Certain functions tend to

dominate the priorities. For example, oil companies tend to be dominated by the technical and cost focus of the refineries, at the expense of marketing, while consumer goods companies tend to be dominated by a marketing and sales focus, at the expense of technology and innovation. High-tech companies have a strong engineering and technology culture, with manufacturing often being a stepchild. When executives from different functional perspectives, especially in companies that historically operated with strong functional silos, attempt to work together as a team, there are blind spots—areas of relative ignorance around which it is difficult to form teams and create consensus because so little shared understanding exists about overall business objectives and the contribution and integration of different functional units.

The development of a Balanced Scorecard, while making such lack of consensus and teamwork more visible, also contributes to the solution of the problem. Because the scorecard is developed by a group of senior executives, as a team project, the scorecard creates a shared model of the entire business to which everyone has contributed. The scorecard objectives become the joint accountability of the senior executive team, enabling it to serve as the organizing framework for a broad array of important team-based management processes. It creates consensus and teamwork among all senior executives, regardless of previous employment experience or functional expertise.

## **COMMUNICATE AND LINK STRATEGIC OBJECTIVES AND MEASURES**

The Balanced Scorecard's strategic objectives and measures are communicated throughout an organization via company newsletters, bulletin boards, videos, and even electronically through groupware and networked personal computers. The communication serves to signal to all employees the critical objectives that must be accomplished if an organization's strategy is to succeed. Some organizations attempt to decompose the high-level strategic measures of the business unit scorecard into specific measures at the operational level. For example, an on-time delivery (OTD) objective on the business unit scorecard can

be translated into an objective to reduce setup times at a specific machine, or to a local goal for rapid transfer of orders from one process to the next. In this way, local improvement efforts become aligned with overall organizational success factors. Once all employees understand high-level objectives and measures, they can establish local objectives that support the business unit's global strategy.

The scorecard also provides the basis for communicating and gaining commitment to a business unit's strategy with corporate-level executives and the board of directors. The scorecard encourages a dialogue between business units and corporate executives and board members, not just about short-term financial objectives, but about the formulation and implementation of a strategy for breakthrough performance for the future.

At the conclusion of the communication and linkage process, everyone in the organization should understand the business unit's long-term goals, as well as the strategy for achieving these goals. Individuals have formulated local actions that will contribute to achieving business unit objectives. And all organizational efforts and initiatives will be aligned to the needed change processes.

## **PLAN, SET TARGETS, AND ALIGN STRATEGIC INITIATIVES**

The Balanced Scorecard has its greatest impact when it is deployed to drive organizational change. Senior executives should establish targets for the scorecard measures, three to five years out, that, if achieved, will transform the company. The targets should represent a discontinuity in business unit performance. If the business unit were a public company, target achievement should produce a doubling or more of the stock price. Organizational financial targets have included doubling the return on invested capital, or a 150% increase in sales during the next five years. An electronics company set a financial target to grow at a rate nearly double the expected growth rate of its existing customers.

To achieve such ambitious financial objectives, managers must identify stretch targets for their customer, internal-business-process,

and learning and growth objectives. These stretch targets can come from several sources. Ideally, the targets for the customer measures should be derived from meeting or exceeding customer expectations. Both existing and potential customer preferences should be examined to identify the expectations for outstanding performance. Benchmarking can be used to incorporate existing best practice and to verify that internally proposed targets will not keep the business unit trailing in strategic measures.

Once targets for customer, internal-business-process, and learning and growth measures are established, managers can align their strategic quality, response time, and reengineering initiatives for achieving the breakthrough objectives. Thus, the Balanced Scorecard provides the front-end justification, as well as focus and integration for continuous improvement, reengineering, and transformation programs. Rather than just apply fundamental process redesign to any local process where gains might be easily obtained, managerial efforts are directed to improving and reengineering processes that are critical for the organization's strategic success. And unlike conventional reengineering programs, where the objective is massive cost cutting (the slash and burn rationale), the reengineering program's objective need not be measured by cost savings alone. The targets for the strategic initiative are derived from such scorecard measures as dramatic time reductions in order fulfillment cycles, shorter time-to-market in product development processes, and enhanced employee capabilities. These time compressions and expanded capabilities, of course, are not the ultimate objective. Through a series of cause-and-effect relationships embodied in the Balanced Scorecard, these capabilities eventually become translated into superior financial performance.

The Balanced Scorecard also enables an organization to integrate its strategic planning with its annual budgeting process. At the time when a business establishes 3–5 year stretch targets for the strategic measures, managers also forecast milestones for each measure during the next fiscal year—how far along they expect to be during the 12 months of year one of the plan. These short-term milestones provide specific targets for assessing progress in the near term along the business unit's long-term strategic trajectory.

The planning and target-setting management process enables the organization to:

- quantify the long-term outcomes it wishes to achieve,
- identify mechanisms and provide resources for achieving those outcomes, and
- establish short-term milestones for the financial and nonfinancial measures on the scorecard.

## **ENHANCE STRATEGIC FEEDBACK AND LEARNING**

The final management process embeds the Balanced Scorecard in a strategic learning framework. We consider this process to be the most innovative and most important aspect of the entire scorecard management process. This process provides the capability for organizational learning at the executive level. Managers in organizations today do not have a procedure to receive feedback about their strategy and to test the hypotheses on which the strategy is based. The Balanced Scorecard enables them to monitor and adjust the implementation of their strategy, and, if necessary, to make fundamental changes in the strategy itself.

By having near-term milestones established for financial, as well as other BSC measures, monthly and quarterly management reviews can still examine financial results. More important, however, they can also examine closely whether the business unit is achieving its targets for customers, for internal processes and innovation, and for employees, systems, and procedures. Management reviews and updates shift from reviewing the past to learning about the future. Managers discuss not only how past results have been achieved but also whether their expectations for the future remain on track.

The process of strategic learning starts with the first process in Figure 1-2, the clarification of a shared vision that the entire organization wants to achieve. The use of measurement as a language

helps translate complex and frequently nebulous concepts into a more precise form that can gain consensus among senior executives. The communication and alignment process, the second process in Figure 1-2, mobilizes all individuals into actions directed at attaining organizational objectives. The emphasis on cause and effect in constructing a scorecard introduces dynamic systems thinking. It enables individuals in various parts of an organization to understand how the pieces fit together, how their role influences others and, eventually, the entire organization. The planning, target setting, and strategic initiative process—the third process in Figure 1-2—defines specific, quantitative performance goals for the organization across a balanced set of outcomes and performance drivers. A comparison of the desired performance goals with current levels establishes the performance gap that strategic initiatives can be designed to close. Thus the Balanced Scorecard not only measures change; it fosters change.

The first three critical management processes shown in Figure 1-2 are vital for implementing strategy. But, by themselves, they are insufficient. For a simpler world, they would be adequate. The theory behind the top-down command-and-control model is that the captain of the ship (the CEO) determines the direction and speed of the ship (the business unit). The sailors (the managers and front-line employees) carry out the orders and implement the plan determined by the captain. Operational and management control systems are established to ensure that the managers and employees act in accordance with the strategic plan established by senior executives. This linear process of establishing a vision and strategy, communicating and linking the vision and strategy to all organizational participants, and aligning organizational actions and initiatives to achieving long-run strategic goals is an example of a single-loop feedback process. With single-loop learning, the objective remains constant. Departures from planned results do not cause people to question whether the planned results are still desirable. Nor do they question whether the methods being used to accomplish the objectives are still appropriate. Departures from the planned trajectory are treated as defects, with remedial actions launched to bring the organization back onto the intended path.

The strategies for information age organizations, however, cannot be this linear or this stable. Today's information age organizations operate in more turbulent environments, and senior managers need to

receive feedback about more complicated strategies. The planned strategy, though initiated with the best of intentions and with the best available information and knowledge, may no longer be appropriate or valid for contemporary conditions. The metaphor is closer to that of sailing in a highly competitive race, under changing weather and sea conditions, than that of steering an isolated ship, through a stable environment, to a destination. In a sailboat race, a chain of command still exists. But the captain is constantly monitoring the environment, being highly sensitive and often responding tactically and strategically to shifts in competitors' behavior, team and boat capabilities, wind conditions, and water current. And the captain must receive information from a myriad of sources, such as personal observation, instrumentation and measurements, and, especially, the advice of tacticians on the boat who also survey the conditions so that they can devise plans to take advantage of environmental changes and to counter competitor behavior.

In such constantly shifting environments, new strategies can emerge from capitalizing on opportunities or countering threats that were not anticipated when the initial strategic plan was articulated. Frequently, ideas for seizing new opportunities come from managers farther down in the organization.<sup>9</sup> Yet traditional management systems do not encourage nor facilitate the formulation, implementation, and testing of strategy in continually changing environments.

Organizations need the capacity for double-loop learning.<sup>10</sup> Double-loop learning occurs when managers question their underlying assumptions and reflect on whether the theory under which they were operating remains consistent with current evidence, observations, and experience. Of course, managers need feedback about whether their planned strategy is being executed according to plan—the single-loop learning process. But even more important, they need feedback about whether the planned strategy remains a viable and successful strategy—the double-loop learning process. Managers need information so that they can question whether the fundamental assumptions made when they launched the strategy are valid.

A properly constructed Balanced Scorecard articulates the theory of the business. The scorecard should be based on a series of cause-and-effect relationships derived from the strategy, including estimates of the response times and magnitudes of the linkages among the

scorecard measures. For example, how long before improvements in product quality and on-time delivery will lead to an increased share of customers' business and higher margins on existing sales, and how large will the effect be? With such quantification of the linkages among scorecard measures, periodic reviews and performance monitoring can take the form of hypothesis testing.

If an organization's employees and managers have delivered on the performance drivers—such as reskilling of employees, availability of information systems, development of new products and services—then failure to achieve the expected outcomes—for example, higher sales or multiple products sold per customer—signals that the theory embodied in the strategy may not be valid. Such disconfirming evidence should be taken seriously. Managers must then engage in an intense dialogue to review market conditions, the value propositions they are delivering to targeted customers, competitor behavior, and internal capabilities. The result may be to reaffirm belief in the current strategy but to adjust the quantitative relationship among the strategic measures on the Balanced Scorecard. Alternatively, the intensive strategic reviews may reveal that an entirely new strategy is required—a double-loop learning outcome—in light of the new knowledge about market conditions and internal capabilities. In either case, the scorecard will have stimulated learning among key executives about the viability and validity of their strategy. In our experience, this process of data gathering, hypothesis testing, reflection, strategic learning, and adaptation is fundamental to the successful implementation of business strategy.

This strategic feedback and learning process completes the loop embodied in Figure 1-2. The strategic-learning process feeds into the next vision and strategy process where the objectives in the various perspectives are reviewed, updated, and replaced in accordance with the most current view of the strategic outcomes and required performance drivers for the upcoming periods.

## **SUMMARY**

Information age companies will succeed by investing in and managing their intellectual assets. Functional specialization must be integrated into customer-based business processes. Mass production and service delivery of standard products and services must be replaced by flexible, responsive, and high-quality delivery of innovative products and services that can be individualized to targeted customer segments. Innovation and improvement of products, services, and processes will be generated by reskilled employees, superior information technology, and aligned organizational procedures.

As organizations invest in acquiring these new capabilities, their success (or failure) cannot be motivated or measured in the short run by the traditional financial accounting model. This financial model, developed for trading companies and industrial age corporations, measures events of the past, not the investments in the capabilities that provide value for the future.

The Balanced Scorecard is a new framework for integrating measures derived from strategy. While retaining financial measures of past performance, the Balanced Scorecard introduces the drivers of future financial performance. The drivers, encompassing customer, internal-business-process, and learning and growth perspectives, are derived from an explicit and rigorous translation of the organization's strategy into tangible objectives and measures.

The Balanced Scorecard, however, is more than a new measurement system. Innovative companies use the scorecard as the central, organizing framework for their management processes. Companies can develop an initial Balanced Scorecard with fairly narrow objectives: to gain clarification, consensus, and focus on their strategy, and then to communicate that strategy throughout the organization. The real power of the Balanced Scorecard, however, occurs when it is transformed from a measurement system to a

management system. As more and more companies work with the Balanced Scorecard, they see how it can be used to

- clarify and gain consensus about strategy,
- communicate strategy throughout the organization,
- align departmental and personal goals to the strategy,
- link strategic objectives to long-term targets and annual budgets,
- identify and align strategic initiatives,
- perform periodic and systematic strategic reviews, and
- obtain feedback to learn about and improve strategy.

The Balanced Scorecard fills the void that exists in most management systems—the lack of a systematic process to implement and obtain feedback about strategy. Management processes built around the scorecard enable the organization to become aligned and focused on implementing the long-term strategy. Used in this way, the Balanced Scorecard becomes the foundation for managing information age organizations.

## NOTES

1. A. D. Chandler, Jr., *Scale and Scope: The Dynamics of Industrial Capitalism* (Cambridge, Mass.: Harvard University Press, 1990).
2. See A. D. Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge, Mass.: Harvard University Press, 1977) and T. H. Johnson and R. S. Kaplan, *Relevance Lost: The Rise and Fall of Management Accounting* (Boston: Harvard Business School Press, 1987).
3. H. Itami, *Mobilizing Invisible Assets* (Cambridge, Mass.: Harvard University Press, 1987).
4. J. Champy and M. Hammer, *Reengineering the Corporation: A Manifesto for Business Revolution* (New York: HarperBusiness, 1993).
5. Industrial age companies used traditional production and service delivery processes to supply different models and options to diverse consumers. This high-cost approach was not made visible until the development of activity based cost systems in the mid-1980s; see R. Cooper and R. S. Kaplan, "Measure Costs Right: Make the Right Decisions," *Harvard Business Review* (September–October 1988): 96–103. Now companies recognize they must either achieve greater focus in the customer segments they choose to serve or deploy technology-based product and service delivery processes that enable high-variety outputs to be supplied at low resource costs.
6. J. L. Bower and C. M. Christensen, "Disruptive Technologies: Catching the Wave," *Harvard Business Review* (January–February 1995): 43–53.
7. R. S. Kaplan and A. Sweeney, "Romeo Engine Plant," 9-194-032 (Boston: Harvard Business School, 1994).
8. R. K. Elliott, "The Third Wave Breaks on the Shores of Accounting," *Accounting Horizons* (June 1992): 61–85.
9. R. Simons, *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal* (Boston: Harvard Business School Press, 1995), 20.
10. For an extensive discussion of single- and double-loop learning in management processes, see Chris Argyris and Donald A. Schön, *Organizational Learning II: Theory, Method, and Practice* (Reading Mass.: Addison-Wesley, 1996); and

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## Chapter Two

# **Why Does Business Need a Balanced Scorecard?**

MEASUREMENT MATTERS: “If you can’t measure it, you can’t manage it.” An organization’s measurement system strongly affects the behavior of people both inside and outside the organization. If companies are to survive and prosper in information age competition, they must use measurement and management systems derived from their strategies and capabilities. Unfortunately, many organizations espouse strategies about customer relationships, core competencies, and organizational capabilities while motivating and measuring performance only with financial measures. The Balanced Scorecard retains financial measurement as a critical summary of managerial and business performance, but it highlights a more general and integrated set of measurements that link current customer, internal process, employee, and system performance to long-term financial success.

## FINANCIAL MEASUREMENT

Historically, the measurement system for business has been financial. Indeed, accounting has been called the “language of business.” Bookkeeping records of financial transactions can be traced back thousands of years, when they were used by Egyptians, Phoenicians, and Sumerians to facilitate commercial transactions. A few centuries later, during the age of exploration, the activities of global trading companies were measured and monitored by accountants’ double-entry books of accounts. The Industrial Revolution, during the nineteenth century, spawned giant textile, railroad, steel, machine-tool, and retailing companies. Innovations in measuring the financial performance of these organizations played a vital role in their successful growth.<sup>1</sup> And financial innovations, such as the return-on-investment (ROI) metric, and operating and cash budgets, were critical to the great success of early-twentieth century enterprises like DuPont and General Motors.<sup>2</sup> The post-World War II trend to diversified enterprises created an intracorporation demand for reporting and evaluation of business unit performance, a practice used extensively by diversified companies like General Electric and made famous, if not notorious, by the rigorous financial reporting and controls of Harold Geneen at IT&T.

Thus, as we stand at the end of the twentieth century, the financial aspect of business unit performance has been highly developed. Many commentators, however, have criticized the extensive, even exclusive use of financial measurements in business.<sup>3</sup> At its heart, an overemphasis on achieving and maintaining short-term financial results can cause companies to overinvest in short-term fixes and to underinvest in long-term value creation, particularly in the intangible and intellectual assets that generate future growth.

As a specific example, the FMC Corporation through the 1970s and 1980s produced one of the best financial performances of any large

U.S. corporation. Yet in 1992, a new management team performed a strategic review to determine the best future course to maximize shareholder value. The review concluded that while excellent short-run operating performance was still important, the company had to launch a growth strategy. Larry Brady, president of FMC, recalled:

*As a highly diversified company, ... the return-on-capital-employed (ROCE) measure was especially important to us. At year-end, we rewarded division managers who delivered predictable financial performance. We had run the company tightly for the past 20 years and had been successful. But it was becoming less clear where future growth would come from and where the company should look for breakthroughs into new areas. We had become a high return-on-investment company but had less potential for further growth. It was also not at all clear from our financial reports what progress we were making in implementing long-term initiatives.*<sup>4</sup>

Inevitably, as managers are pressured to deliver consistent and excellent short-term financial performance, trade-offs are made that limit the search for investments in growth opportunities. Even worse, the pressure for short-term financial performance can cause companies to reduce spending on new product development, process improvements, human resource development, information technology, data bases, and systems as well as customer and market development. In the short run, the financial accounting model reports these spending cutbacks as increases in reported income, even when the reductions have cannibalized a company's stock of assets and its capabilities for creating future economic value. Alternatively, a company could maximize short-term financial results by exploiting customers through high prices or lower service. In the short run, these actions enhance reported profitability, but the lack of customer loyalty and satisfaction will leave the company highly vulnerable to competitive inroads.

As another example, Xerox, up through the mid-1970s, enjoyed a virtual monopoly on plain paper copiers. Xerox did not sell its machines; it leased them and earned revenues on every copy made on these machines. Sales and profits from leasing machines, and those of supporting items like paper and toner, were large and growing. But customers, apart from concern about high copying costs, for which no

ready alternative was available, were disgruntled about the high breakdown rates and malfunctions of these expensive machines.<sup>5</sup> Rather than redesign the machines so that they would break down less frequently, Xerox executives saw an opportunity to enhance their financial results even further. They permitted direct purchase of their machines, and then established an extensive field service force as a separate profit center, to repair broken machines at customer locations. Given the demand for its services, this division soon was a substantial contributor to Xerox's profit growth. Furthermore, since no output could be produced while waiting for the service person, companies bought additional machines as backups, so sales and profits grew even higher. Thus, all the financial indicators—sales and profit growth, return on investment—were signaling a highly successful strategy.

But customers were still unhappy and surly. They did not want their supplier to excel at having a superb field service force. They wanted cost-efficient machines that did not break down. When Japanese and American entrants were eventually able to offer machines that produced comparable or even better quality copies, that did not break down, and that were lower priced, they were embraced by Xerox's dissatisfied and disloyal customers. Xerox, one of the most successful U.S. companies from 1955 to 1975, almost failed. Only under a new CEO, with a passion for quality and customer service that he communicated throughout the organization, did the company make a remarkable turnaround in the 1980s.

Financial measures are inadequate for guiding and evaluating organizations' trajectories through competitive environments. They are lagging indicators that fail to capture much of the value that has been created or destroyed by managers' actions in the most recent accounting period. The financial measures tell some, but not all, of the story about past actions and they fail to provide adequate guidance for the actions to be taken today and the day after to create future financial value.

## THE BALANCED SCORECARD

The Balanced Scorecard provides executives with a comprehensive framework that translates a company's vision and strategy into a coherent set of performance measures. Many companies have adopted mission statements to communicate fundamental values and beliefs to all employees. The mission statement addresses core beliefs and identifies target markets and core products. For example,

*To be the most successful company in the airline business.*

*To be the best broad-based financial institution in our chosen markets.*

Mission statements should be inspirational. They should supply energy and motivation to the organization.<sup>6</sup> But inspirational mission statements and slogans are not sufficient. As Peter Senge observed: "Many leaders have personal visions that never get translated into shared visions that galvanize an organization. What has been lacking is a discipline for translating individual vision into shared vision."<sup>7</sup>

As a specific example, Norman Chambers, the chief executive officer of Rockwater, an undersea construction company, led a two-month effort among senior executives and project managers to develop a detailed mission statement. Shortly after distributing this mission statement, Chambers received a phone call from a project manager on a drilling platform in the middle of the North Sea. "Norm, I want you to know that I believe in the mission statement. I want to act in accordance with the mission statement. I'm here with my customer. What am I supposed to do? How should I be behaving each day, over the life of this project, to deliver on our mission statement?" Chambers realized that there was a large void between the mission statement and employees' day-to-day actions.

The Balanced Scorecard translates mission and strategy into objectives and measures, organized into four different perspectives: financial, customer, internal business process, and learning and growth. The scorecard provides a framework, a language, to communicate mission and strategy; it uses measurement to inform employees about the drivers of current and future success. By articulating the outcomes the organization desires and the drivers of those outcomes, senior executives hope to channel the energies, the abilities, and the specific knowledge of people throughout the organization toward achieving the long-term goals.

Many people think of measurement as a tool to control behavior and to evaluate past performance. As we discussed in [Chapter 1](#), the measures on a Balanced Scorecard should be used in a different way—to articulate the strategy of the business, to communicate the strategy of the business, and to help align individual, organizational, and cross-departmental initiatives to achieve a common goal. Used in this way, the scorecard does not strive to keep individuals and organizational units in compliance with a pre-established plan, the traditional control system objective. The Balanced Scorecard should be used as a communication, informing, and learning system, *not* a controlling system.

The four perspectives of the scorecard permit a balance between short-and long-term objectives, between outcomes desired and the performance drivers of those outcomes, and between hard objectives measures and softer, more subjective measures. While the multiplicity of measures on a Balanced Scorecard may seem confusing, properly constructed scorecards, as we will see, contain a unity of purpose since all the measures are directed toward achieving an integrated strategy.

## ***Financial Perspective***

The BSC retains the financial perspective since financial measures are valuable in summarizing the readily measurable economic consequences of actions already taken. Financial performance measures indicate whether a company's strategy, implementation, and execution are contributing to bottom-line improvement. Financial objectives typically relate to profitability—measured, for example, by operating income, return-on-capital employed, or, more recently, economic value-added. Alternative financial objectives can be rapid sales growth or generation of cash flow. We will discuss, in [Chapter 3](#), the linkages between a business's strategy and its objectives and measures for the financial perspective.

## ***Customer Perspective***

In the customer perspective of the Balanced Scorecard, managers identify the customer and market segments in which the business unit will compete and the measures of the business unit's performance in these targeted segments. This perspective typically includes several core or generic measures of the successful outcomes from a well-formulated and -implemented strategy. The core outcome measures include customer satisfaction, customer retention, new customer acquisition, customer profitability, and market and account share in targeted segments. But the customer perspective should also include specific measures of the value propositions that the company will deliver to customers in targeted market segments. The segment-specific drivers of core customer outcomes represent those factors that are critical for customers to switch to or remain loyal to their suppliers. For example, customers could value short lead times and on-time delivery. Or a constant stream of innovative products and services. Or a supplier able to anticipate their emerging needs and capable of developing new products and approaches to satisfy those needs. The customer perspective enables business unit managers to articulate the customer and market-based strategy that will deliver superior future financial returns. [Chapter 4](#) presents an extensive discussion of the development of objectives and measures for the customer perspective.

## ***Internal-Business-Process Perspective***

In the internal-business-process perspective, executives identify the critical internal processes in which the organization must excel. These processes enable the business unit to:

- deliver the value propositions that will attract and retain customers in targeted market segments, and
- satisfy shareholder expectations of excellent financial returns.

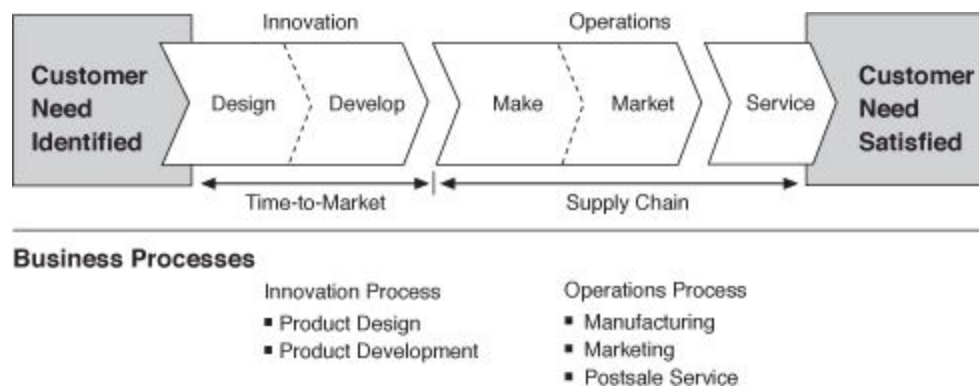
The internal-business-process measures focus on the internal processes that will have the greatest impact on customer satisfaction and achieving an organization's financial objectives.

The internal-business-process perspective reveals two fundamental differences between the traditional and the BSC approaches to performance measurement. Traditional approaches attempt to monitor and improve existing business processes. They may go beyond financial measures of performance by incorporating quality and time-based metrics. But they still focus on improvement of existing processes. The scorecard approach, however, will usually identify entirely new processes at which an organization must excel to meet customer and financial objectives. For example, a company may realize that it must develop a process to anticipate customer needs or one to deliver new services that target customers value. The BSC internal-business-process objectives highlight the processes, several of which it may not be currently be performing at all, that are most critical for an organization's strategy to succeed.

The second departure of the BSC approach is to incorporate innovation processes into the internal-business-process perspective (see Figure 2-1). Traditional performance measurement systems focus

on the processes of delivering today's products and services to today's customers. They attempt to control and improve existing operations that represent the *short wave* of value creation. This short wave of value creation begins with the receipt of an order from an existing customer for an existing product (or service) and ends with the delivery of the product to the customer. The organization creates value from producing, delivering, and servicing this product and the customer at a cost below the price it receives.

Figure 2-1 The Internal-Business-Process Value-Chain Perspective



But the drivers of long-term financial success may require an organization to create entirely new products and services that will meet the emerging needs of current and future customers. The innovation process, the *long wave* of value creation, is for many companies a more powerful driver of future financial performance than the short-term operating cycle. For many companies, their ability to manage successfully a multiyear product-development process or to develop a capability to reach entirely new categories of customers may be more critical for future economic performance than managing existing operations efficiently, consistently, and responsively.

Managers, however, do not have to choose between these two vital internal processes. The internal-business-process perspective of the Balanced Scorecard incorporates objectives and measures for both the longwave innovation cycle as well as the short-wave operations cycle. [Chapter 5](#) contains many examples of how companies are formulating objectives and measures for the internal-business-process perspective.

## ***Learning and Growth Perspective***

The fourth perspective of the Balanced Scorecard, learning and growth, identifies the infrastructure that the organization must build to create long-term growth and improvement. The customer and internal-business-process perspectives identify the factors most critical for current and future success. Businesses are unlikely to be able to meet their long-term targets for customers and internal processes using today's technologies and capabilities. Also, intense global competition requires that companies continually improve their capabilities for delivering value to customers and shareholders.

Organizational learning and growth come from three principal sources: people, systems, and organizational procedures. The financial, customer, and internal-business-process objectives on the Balanced Scorecard typically will reveal large gaps between the existing capabilities of people, systems, and procedures and what will be required to achieve breakthrough performance. To close these gaps, businesses will have to invest in reskilling employees, enhancing information technology and systems, and aligning organizational procedures and routines. These objectives are articulated in the learning and growth perspective of the Balanced Scorecard. As in the customer perspective, employee-based measures include a mixture of generic outcome measures—employee satisfaction, retention, training, and skills—along with specific drivers of these generic measures, such as detailed, business-specific indexes of the particular skills required for the new competitive environment. Information systems capabilities can be measured by real-time availability of accurate, critical customer and internal process information to employees on the front lines of decision making and actions. Organizational procedures can examine alignment of employee incentives with overall organizational success factors, and measured rates of improvement in critical customer-based and internal processes. These issues are explored in further detail in [Chapter 6](#).

Altogether, the Balanced Scorecard translates vision and strategy into objectives and measures across a balanced set of perspectives.

The scorecard includes measures of desired outcomes as well as processes that will drive the desired outcomes for the future.

## LINKING MULTIPLE SCORECARD MEASURES TO A SINGLE STRATEGY

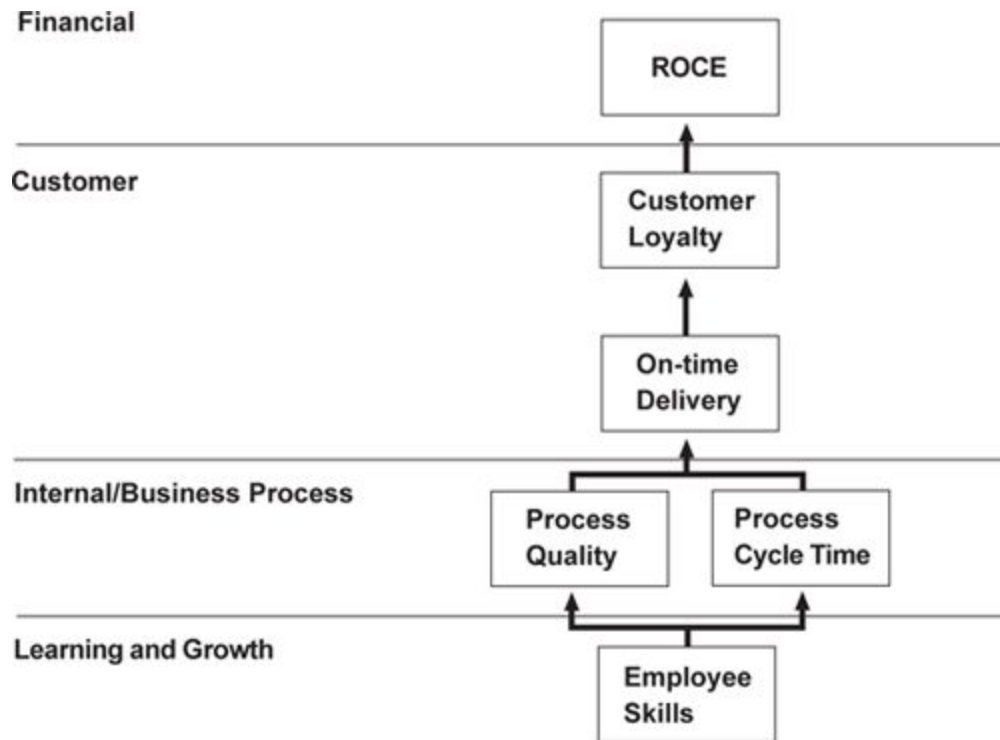
Many companies may already be using a mixture of financial and nonfinancial measures, even in senior management reviews and to communicate with boards of directors. Especially in recent years, the renewed focus on customers and process quality has caused many organizations to track and communicate measures on customer satisfaction and complaints, product and process defect levels, and missed delivery dates. In France, companies have developed and used, for more than two decades, the *Tableau de Bord*, a dashboard of key indicators of organizational success. The *Tableau de Bord* is designed to help employees “pilot” the organization by identifying key success factors, especially those that can be measured as physical variables.<sup>8</sup> Does a dashboard of financial and nonfinancial indicators supply a “Balanced Scorecard?”

Our experience is that the best Balanced Scorecards are more than collections of critical indicators or key success factors. The multiple measures on a properly constructed Balanced Scorecard should consist of a linked series of objectives and measures that are both consistent and mutually reinforcing. The metaphor should be a flight simulator, not a dashboard of instrument dials. Like a flight simulator, the scorecard should incorporate the complex set of cause-and-effect relationships among the critical variables, including leads, lags, and feedback loops, that describe the trajectory, the flight plan, of the strategy. The linkages should incorporate both cause-and-effect relationships, and mixtures of outcome measures and performance drivers.

## ***Cause-and-Effect Relationships***

A strategy is a set of hypotheses about cause and effect. The measurement system should make the relationships (hypotheses) among objectives (and measures) in the various perspectives explicit so that they can be managed and validated. The chain of cause and effect should pervade all four perspectives of a Balanced Scorecard. For example, return-on-capital-employed may be a scorecard measure in the financial perspective. The driver of this measure could be repeat and expanded sales from existing customers, the result of a high degree of loyalty among those customers. So, customer loyalty is included on the scorecard (in the customer perspective) because it is expected to have a strong influence on ROCE. But how will the organization achieve customer loyalty? Analysis of customer preferences may reveal that on-time delivery of orders is highly valued by customers. Thus, improved OTD is expected to lead to higher customer loyalty, which, in turn, is expected to lead to higher financial performance. So both customer loyalty and OTD are incorporated into the customer perspective of the scorecard.

The process continues by asking what internal processes must the company excel at to achieve exceptional on-time delivery. To achieve improved OTD, the business may need to achieve short cycle times in operating processes and high-quality internal processes, both factors that could be scorecard measures in the internal perspective. And how do organizations improve the quality and reduce the cycle times of their internal processes? By training and improving the skills of their operating employees, an objective that would be a candidate for the learning and growth perspective. We can now see how an entire chain of cause-and-effect relationships can be established as a vertical vector through the four BSC perspectives:



In a similar vein, recent work in the service profit chain has emphasized the causal relationships among employee satisfaction, customer satisfaction, customer loyalty, market share, and, eventually, financial performance.<sup>9</sup>

Thus, a properly constructed Balanced Scorecard should tell the story of the business unit's strategy. It should identify and make explicit the sequence of hypotheses about the cause-and-effect relationships between outcome measures and the performance drivers of those outcomes. Every measure selected for a Balanced Scorecard should be an element in a chain of cause-and-effect relationships that communicates the meaning of the business unit's strategy to the organization.

## ***Performance Drivers***

A good Balanced Scorecard should also have a mix of outcome measures and performance drivers. Outcome measures without performance drivers do not communicate how the outcomes are to be achieved. They also do not provide an early indication about whether the strategy is being implemented successfully. Conversely, performance drivers—such as cycle times and part-per-million (PPM) defect rates—without outcome measures may enable the business unit to achieve short-term operational improvements, but will fail to reveal whether the operational improvements have been translated into expanded business with existing and new customers, and, eventually, to enhanced financial performance. A good Balanced Scorecard should have an appropriate mix of outcomes (lagging indicators) and performance drivers (leading indicators) of the business unit's strategy.

[Chapter 7](#) elaborates further on the theme that the Balanced Scorecard is not merely a collection of financial and nonfinancial measurements. The scorecard should be the translation of the business unit's strategy into a linked set of measures that define both the long-term strategic objectives, as well as the mechanisms for achieving those objectives.

## **SHOULD FINANCIAL MEASURES BE SCRAPPED?**

Is the financial objective component in a Balanced Scorecard even relevant for driving the long-term performance of the organization? As noted, some critics see many business managers' short-term orientation arising from and inherent in attempting to achieve financial targets for measures like return-on-capital-employed, earnings-per-share, or even current share price. Several critics have advocated scrapping financial measures entirely to measure business unit performance. They argue that in today's technologically and customer-driven global competition, financial measures provide poor guidelines for success. They urge managers to focus on improving customer satisfaction, quality, cycle times, and employee skills and motivation. According to this theory, as companies make fundamental improvements in their operations, the financial numbers will take care of themselves.

Not all companies are able to translate improvements in quality and customer satisfaction into bottom-line financial results. Take the example of one electronics company, which, during the 1987–1990 period, had made remarkable improvements in its quality and on-time delivery performance. Outgoing defect rates dropped by a factor of 10, yields doubled, and missed delivery dates dropped from 30% to 4%. Yet these breakthrough improvements in quality, productivity, and customer service failed to deliver financial benefits. During the same three-year period, this former growth company produced flat financial performance, and disappointed shareholders saw the company's stock price drop by 70%.

How could such an anomalous outcome occur? Many quality and productivity improvement programs greatly expand the effective capacity of the organization. As companies, such as the electronics company described above, improve their quality and response times, they eliminate the need to build, inspect, and rework out-of-conformance products, and they no longer require people or systems to

reschedule and expedite delayed orders. In general, once companies eliminate waste and defects, cease doing rework, rescheduling, engineering change orders, and expediting, and gain greater integration among suppliers, internal operations, and customers, they can produce the same quantity of output with much lower demands on resources. But in the short to intermediate term, commitments have already been made to most of the organization's resources, a situation often described as having high "fixed" costs. So reducing demands on resources creates unused capacity but few substantial reductions in spending.

But what about improvements in customer satisfaction, say from delivering zero-defect orders with perfect on-time delivery? If customers' sales are flat or declining, they may not be able to reward their better suppliers with increased business. The company described above was already the number one supplier to many of its customers. Customers may wish to retain one or two backup suppliers so that they are not completely dependent upon a single supplier. If customers are not able or willing to give increased business to a supplier, and if the supplier is reluctant to lay off employees (not unreasonable, since the employees were the source of the improvements in quality, productivity, and customer service), the operational improvements are not easily translated into higher profitability. Improved financial results are not an automatic outcome of operational improvement programs to improve quality and reduce cycle times.

Periodic financial statements and financial measures must continue to play an essential role in reminding executives that improved quality, response times, productivity, and new products are means to an end, not the end itself. Such improvements only benefit a company when they can be translated into improved sales, reduced operating expenses, or higher asset utilization. Not all long-term strategies are profitable strategies. IBM, Digital Equipment Corporation, and General Motors in the 1980s did not lack for long-term visions. These companies made huge investments in advanced manufacturing technologies, quality, and research and development. But their guiding vision and business model for success differed from what their markets were now rewarding. They did not recognize early enough that the failure of their financial measures to respond to their investment strategy was a powerful signal that they should reexamine the basic assumptions of their strategy. A failure to convert improved operational

performance into improved financial performance should send executives back to the drawing board to rethink the company's strategy or its implementation plans.

Companies with greatly improved operating performance must identify how to increase sales to existing customers, how to market new products with attractive capabilities, and how to market the company's products and services to entirely new customers and market segments. Such new segments, previously inaccessible to a company, could become valued customers because of a company's improved capabilities in lower cost, superior performance, and higher quality, delivery, and customer service.

A comprehensive system of measurement and management must specify how improvements in operations, customer service, and new products and services link to improved financial performance, through higher sales, greater operating margins, faster asset turnover, and reduced operating expenses. The Balanced Scorecard must retain a strong emphasis on financial outcomes. Ultimately, causal paths from all the measures on a scorecard should be linked to financial objectives. The scorecard obtains the benefits from keeping financial measurements as ultimate outcomes, without the myopia and distortions that come from an exclusive focus on improving short-term financial measures.

## FOUR PERSPECTIVES: ARE THEY SUFFICIENT?

The four perspectives of the Balanced Scorecard have been found to be robust across a wide variety of companies and industries. But the four perspectives should be considered a template, not a strait jacket. No mathematical theorem exists that four perspectives are both necessary and sufficient. We have yet to see companies using fewer than these four perspectives, but, depending on industry circumstances and a business unit's strategy, one or more additional perspectives may be needed. For example, some people have expressed concern that although the Balanced Scorecard explicitly recognizes the interests of shareholders and customers, it does not explicitly incorporate the interests of other important stakeholders, such as employees, suppliers, and the community. The employee perspective is certainly incorporated in virtually all scorecards within the learning and growth perspective. Similarly, if strong supplier relationships are part of the strategy leading to breakthrough customer and/or financial performance, the outcome and performance driver measures for supplier relationships should be incorporated within the organization's internal-business-process perspective. But we don't think that all stakeholders are automatically entitled to a position on a business unit's scorecard. The scorecard outcomes and performance drivers should measure those factors that create competitive advantage and breakthroughs for an organization.

Take the example of a chemicals company that wished to create an entirely new perspective to reflect environmental considerations. We challenged them:

*Keeping the environment clean is important. Companies must comply with laws and regulations, but such compliance doesn't seem to be the basis for competitive advantage.*

The CEO and other senior executives responded immediately:

*We don't agree. Our franchise is under severe pressure in many of the communities where we operate. Our strategy is to go well beyond what current laws and regulations require so that we can be seen in every community as not only a law-abiding corporate citizen but as the outstanding corporate citizen, measured both environmentally and by creating well-paying, safe, and productive jobs. If regulations get tightened, some of our competitors may lose their franchise, but we expect to have earned the right to continue operations.*

They insisted that outstanding environmental and community performance was a central part of that company's strategy and had to be an integral part of its scorecard.

Thus, all stakeholder interests, when they are vital for the success of the business unit's strategy, can be incorporated in a Balanced Scorecard. Stakeholder objectives, however, should not be appended to the scorecard via an isolated set of measures that managers must keep "in control." Other measurement and control systems can establish diagnostic and compliance requirements far more effectively than the Balanced Scorecard.<sup>10</sup> The measures that appear on the Balanced Scorecard should be fully integrated into the chain of causal event linkages that define and tell the story of the business unit's strategy.

## **ORGANIZATIONAL UNIT FOR A BALANCED SCORECARD**

Some companies operate within only a single industry. Indeed, some of the early applications of the Balanced Scorecard were for companies in particular niches of the semiconductor industry, like Advanced Micro Devices (AMD) and Analog Devices, or in a particular segment of the computer industry, like Apple Computer. These companies developed Balanced Scorecards that were also Corporate Scorecards (the term used at Analog Devices). Most corporations, however, are sufficiently diverse that constructing a corporate-level scorecard may be a difficult first task. Balanced Scorecards are best defined for strategic business units (SBUs). An ideal strategic business unit for a Balanced Scorecard conducts activities across an entire value chain: innovation, operations, marketing, distribution, selling, and service. Such an SBU has its own products and customers, marketing and distribution channels, and production facilities. And, most important, it has a well-defined strategy.

Once a Balanced Scorecard has been developed for an SBU, it becomes the basis for Balanced Scorecards for departments and functional units within the SBU. Mission and strategy statements for departments and functional units can be defined within the framework established by the business unit mission, strategy, and scorecard. Managers in departments and functional units can then develop their own scorecards that will be consistent with and help deliver the SBU mission and strategy. In this way, the SBU scorecard is cascaded down to local responsibility centers within the SBU, allowing all responsibility centers to work coherently toward the SBU objectives. The relevant question for whether a department or functional unit should have a Balanced Scorecard is whether that organizational unit has (or should have) a mission, a strategy, customers (internal or external), and internal processes that enable it to accomplish its mission and strategy. If it does, the unit is a valid candidate for a Balanced Scorecard.

If the organizational unit is defined too broadly, say beyond a strategic business unit, however, it may be difficult to define a coherent, integrated strategy. Instead, the scorecard objectives and measures may end up as an average or a blend of several different strategies. For example, originally we attempted to help an industrial gases company create a scorecard. Early on, it became clear that the company had three distinct business units, each defined by a unique distribution channel that had entirely different strategies and customers. It proved far simpler to construct scorecards for the individual SBUs, defined by their unique distribution channels.

Often, however, even corporations containing several, somewhat independent SBUs have started by developing a Balanced Scorecard at the corporate level. Such a corporate-level scorecard establishes a common framework, a corporate template, about themes and common visions that must be implemented in the scorecards developed at the individual SBUs. The corporate scorecard also establishes how the corporation adds value beyond the value created by the collection of SBUs operating as independent units. This value-creating role of the corporation is referred to by Goold and colleagues as the “parenting advantage.”<sup>11</sup> [Chapter 8](#) elaborates further on integrating SBU scorecards into the broader corporate framework.

## **STRATEGIC POSITIONING OR CORE COMPETENCIES/CAPABILITIES-DRIVEN?**

In this book we will approach strategy as choosing the market and customer segments the business unit intends to serve, identifying the critical internal business processes that the unit must excel at to deliver the value propositions to customers in the targeted market segments, and selecting the individual and organizational capabilities required for the internal, customer, and financial objectives. This approach is consistent with the industry and competitive analysis articulated in several of Michael Porter's widely followed corporate strategy books.<sup>12</sup> We have seen this approach work well with dozens of organizations, as we will illustrate in subsequent chapters.

Alternatively, some companies compete by exploiting unique capabilities, resources, and core competencies.<sup>13</sup> For example, Honda leverages its capabilities for designing and building superb engines into market segments—motorcycles, automobiles, lawn mowers, utilities—where this capability gives it competitive advantage. Canon leverages its world-class capabilities in optics and miniaturization, developed initially for cameras, into other products, such as copying and facsimile machines and computer printers. Companies deploying a strategy based on core competencies or unique capabilities may wish to start their strategic planning process by identifying these critical competencies and capabilities for their internal-business-process perspective, and then, for the customer perspective, selecting customer and market segments where these competencies and capabilities are most critical for delivering customer value.

The Balanced Scorecard is primarily a mechanism for strategy implementation, not for strategy formulation.<sup>14</sup> It can accommodate either approach for formulating business unit strategy—starting from the customer perspective, or starting from excellent internal-business-

process capabilities. For whatever approach that SBU senior executives use to formulate their strategy, the Balanced Scorecard will provide an invaluable mechanism for translating that strategy into specific objectives, measures, and targets, and monitoring the implementation of that strategy during subsequent periods.

## **APPENDIX: LIMITATIONS OF FINANCIAL MEASUREMENTS OF BUSINESS PERFORMANCE**

Several reports have expressed concern with an overemphasis on financial measures of corporate performance. The Harvard Business School Council on Competitiveness project identified the following systematic differences between investments made by U.S. corporations versus those made in Japan and Germany:

- The U.S. system is less supportive of long-term corporate investment because of the emphasis on improving short-term returns to influence current share prices.
- The U.S. system favors those forms of investment for which returns are most readily measurable; this leads to underinvestment in intangible assets—product and process innovation, employee skills, customer satisfaction—whose short-term returns are more difficult to measure.
- The U.S. system leads to overinvestment in assets that can be easily valued (such as through mergers and acquisitions) and to underinvestment in internal development projects whose returns are more difficult to value.
- The U.S. system allows companies with very strong asset bases (such as in natural resources, consumer goods companies with strong brand names, and film and broadcast companies) to operate inefficiently, without fully exploiting their undervalued assets, as long as short-term earnings are satisfactory. Realizing the value from these company's assets required expensive financial innovations involving hostile tender offers, leveraged buyouts, and issuance of junk bonds.<sup>[15](#)</sup>

Additional evidence comes from external investors expressing dissatisfaction with seeing only financial reports of past performance. They want information that will help them forecast the future performance of companies in which they have invested their capital (or in which they are contemplating investing). For example, Peter C. Lincoln, vice president of the U.S. Steel and Carnegie Pension Fund stated: “Nonfinancial performance measurement—such as measuring customer satisfaction or the speed at which new products move from the development stage—would be very helpful to investors and analysts. Companies should report this type of information to provide a complete picture of their operations.”<sup>16</sup>

The concern with the overemphasis on financial performance measures has even permeated the leading U.S. professional association of public accountants. A high-level special committee on financial reporting of the American Institute of Certified Public Accountants reinforced our concerns with exclusive reliance on financial reporting for measuring business performance: “Users focus on the future while today’s business reporting focuses on the past. Although information about the past is a useful indicator of future performance, users also need forward-looking information.” The committee acknowledged the importance of reporting on how well companies are creating value for the future. The committee recommended linking business performance reporting to management’s strategic vision: “Many users want to see a company through the eyes of management to help them understand management’s perspective and predict where management will lead the company.” It went on to say that nonfinancial measurement must play a key role: “Management should disclose the financial and nonfinancial measurements it uses in managing the business that quantify the effects of key activities and events.”<sup>17</sup>

The committee concluded by recommending that companies adopt a more “balanced” and forward-looking approach:

*To meet users’ changing needs, business reporting must:*

- *Provide more information about plans, opportunities, risks and uncertainties*
- *Focus more on the factors that create longer-term value, including nonfinancial measures indicating how key business processes are performing*
- *Better align information reported externally with the information reported internally to senior management to manage the business.*<sup>[18](#)</sup>

We discuss the opportunities for using the Balanced Scorecard for external reporting in [Chapter 9](#).

## NOTES

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- [14.](#) As many organizations start to develop Balanced Scorecards, however, they soon realize that they lack consensus about their business unit's strategy. In such cases, the development of Balanced Scorecard objectives and measures becomes the catalyst for a more precise strategy formulation process among the senior executives.
- [15.](#) Michael E. Porter, "Capital Disadvantage: America's Failing Capital Investment System," *Harvard Business Review* (September–October 1992): 73.
- [16.](#) The AICPA Special Committee on Financial Reporting, *Improving Business Reporting—A Customer Focus: Meeting the Information Needs of Investors and Creditors* (New York: American Institute of Certified Public Accountants, 1994), 9.
- [17.](#) Ibid., 10.
- [18.](#) Ibid., 30.

# PART ONE

## M EASURING B USINESS S TRATEGY

COMPANIES USING THE BALANCED SCORECARD as the corner-stone of a new strategic management system have two tasks: first, they must build the scorecard, and, second, they must use the scorecard. We have organized the book into these two tasks. [Part One, Chapters 3 through 8](#), describes the construction of a Balanced Scorecard. [Part Two, Chapters 9 through 12](#), explains how companies are using the Balanced Scorecard as an integrated strategic-management system.

Of course, the two tasks are not independent. As managers start to use their scorecard for key management processes, they will gain further insights about the scorecard itself—which measures are not working, which measures should be modified, and which new measures of strategic success have emerged that should be incorporated into the scorecard.

[Chapters 3 through 6](#) cover the fundamentals for building objectives and measures in each of the four scorecard perspectives: financial, customer, internal business process, and learning and growth. In each

chapter, we identify generic measures that show up in most organization's scorecards, such as the following:

| <b>Perspective</b> | <b>Generic Measures</b>                                       |
|--------------------|---------------------------------------------------------------|
| Financial          | Return on investment and economic value-added                 |
| Customer           | Satisfaction, retention, market, and account share            |
| Internal           | Quality, response time, cost, and new product introductions   |
| Learning Growth    | and Employee satisfaction and information system availability |

We stress, however, the importance of incorporating measures that are specifically derived from an organization's strategy. We show, with specific examples, how objectives and measures in each of the four perspectives have been derived to communicate and help implement the strategy.

[Chapter 7](#) provides the integration of this strategic theme by illustrating the importance of linking the objectives and measures in the four perspectives into broad, interrelated strategic themes. The linkage of measures across the four perspectives clearly shows that the scorecard is not an ad hoc collection of two dozen or so measures that managers must juggle and trade-off against one another. Rather, in a good Balanced Scorecard, the measures should be linked to communicate a small number of broad strategic themes, such as grow the business, reduce risk, or increase productivity. In [Chapter 7](#) the strategic measures developed in [Chapters 3](#) through [6](#) are brought together to articulate what constitutes a good Balanced Scorecard.

[Chapters 3](#) through [7](#) describe Balanced Scorecards for a single organizational unit—the strategic business unit (SBU). [Chapter 8](#) extends the concept to developing a Balanced Scorecard for a corporation or sector that comprises several business units within the same organization. We apply the notion of corporate-level strategy to identify the broad themes that enable the whole (the corporation) to be more valuable than the sum of its parts (the operating divisions). We

trace the implications of the corporate-level strategy to the Balanced Scorecards that will be developed for related but decentralized operating units and corporate-level functional departments. [Chapter 8](#) also shows how Balanced Scorecards have been developed for organizational units in the government and not-for-profit sectors.

## **BALANCED SCORECARD COMPANIES**

Throughout the book, we illustrate the innovative measurement practices from many companies. But the comprehensive use of the Balanced Scorecard is told through the experiences of five companies that we have followed closely for the past three years: Rockwater, Metro Bank, Pioneer Petroleum, National Insurance, and Kenyon Stores.

Rockwater is a several-hundred-million-dollar undersea construction company whose clients are major oil, gas, and offshore construction companies. Rockwater, headquartered in Aberdeen, Scotland, is an operating division of Brown & Root Energy Services which, in turn, is part of the Halliburton Corporation, a \$4-billion worldwide construction company, headquartered in Dallas, Texas. Rockwater was formed in 1989 by merging two previously independent construction companies, one British and one Dutch. Rockwater's first president, Norman Chambers, used the Balanced Scorecard, starting in 1992, to unite the culture and operating philosophy of the two companies and to enable the new company to compete on the basis of quality, safety, and value-added relationships with customers, not low price. In 1994, Norman Chambers was promoted to president of Brown & Root Energy Services, where he continues to use the Balanced Scorecard as his strategic management system, now applying it at the group level and to each of the operating companies in the group.

Metro Bank is the retail banking division of a major bank with 8,000 employees, a 30% market share of the region's core deposit accounts, and about \$1 billion in total revenue. The corporate parent is the surviving entity of a merger of two large and highly competitive banks in a major U.S. metropolitan area. The CEO of Metro Bank implemented the Balanced Scorecard, starting in 1993, to communicate and reinforce a new strategy for the merged retail bank, which would shift from its current focus and strengths in transaction-oriented services to

offering a full range of financial products and services to targeted customer segments.

Pioneer Petroleum is the U.S. marketing and refining division of a large worldwide integrated petroleum company. Its CEO launched a scorecard process in 1993 to replace the division's extensive financial analysis and control approach with a new strategic performance-management process. The effort started with a divisionwide scorecard that identified targeted customer segments and broad themes, and then rolled out to developing scorecards for every business and service unit in the division.

National Insurance is the property and casualty division of one of the major, comprehensive U.S. insurance companies. In 1993, when it launched its scorecard project, National had 6,500 employees and \$4 billion in revenues. But its operating results were so dismal, with losses measured in the hundreds of millions of dollars, that the parent corporation was considering closing down the company and exiting the property and casualty business entirely. Corporate, in a last ditch effort to save the division, brought in a new management team from outside. The team decided to shift the company from its generalist strategy, where it attempted to provide all underwriting services to all customers and market segments, to a specialist strategy. The team launched its scorecard program to clarify the new strategy and to develop and coordinate the necessary implementation programs. This program also expanded to develop a new strategic management system that succeeded in transforming National into a profitable insurer.

Kenyon Stores is a preeminent U.S. clothing retailer that operates 10 independent retail chains with more than 4,000 outlets and about \$8 billion in annual sales. Historically, the individual chains operated independently with little central coordination or integration. Kenyon's CEO turned to the Balanced Scorecard in 1994 as part of his new strategy to leverage key corporate-level resources and direction to achieve an ambitious sales growth target of \$20 billion by the year 2000, mainly from internal growth.

In addition to these five companies, we also draw upon the experience of Analog Devices and FMC Corporation, which were early adopters of the Balanced Scorecard.



## Chapter Three

## Financial Perspective

BUILDING A BALANCED SCORECARD should encourage business units to link their financial objectives to corporate strategy. The financial objectives serve as the focus for the objectives and measures in all the other scorecard perspectives. Every measure selected should be part of a link of cause-and-effect relationships that culminate in improving financial performance. The scorecard should tell the story of the strategy, starting with the long-run financial objectives, and then linking them to the sequence of actions that must be taken with financial processes, customers, internal processes, and finally employees and systems to deliver the desired long-run economic performance. For most organizations, the financial themes of increasing revenues, improving cost and productivity, enhancing asset utilization, and reducing risk can provide the necessary linkages across all four scorecard perspectives.

Many corporations, however, use identical financial objectives for all their divisions and business units. For example, each business unit may be asked to achieve the same 16% return-on-capital-employed objective that has been established for the entire corporation. Alternatively, if the corporation is employing the economic value-added metric,<sup>1</sup> every business may be told to maximize its economic value-added each period. While this uniform approach is certainly feasible, consistent, and, in some sense, “fair” since all business unit managers will be evaluated by the same metric, it fails to recognize that different business units may follow quite different strategies. Thus, it would be unlikely for one financial metric, and especially a single target for a single financial metric, to be appropriate across a wide range of

business units. So when they start developing the financial perspective for their Balanced Scorecard, business unit executives should determine appropriate financial metrics for their strategy. Financial objectives and measures must play a dual role: they define the financial performance expected from the strategy, and they serve as the ultimate targets for the objectives and measures of all the other scorecard perspectives.

## LINKING FINANCIAL OBJECTIVES TO BUSINESS UNIT STRATEGY

Financial objectives can differ considerably at each stage of a business's life cycle. Business strategy theory suggests several different strategies that business units can follow, ranging from aggressive market share growth down to consolidation, exit, and liquidation.<sup>2</sup> For simplification purposes, we identify just three stages:<sup>3</sup>

- Growth
- Sustain
- Harvest

*Growth* businesses are at the early stages of their life cycle. They have products or services with significant growth potential. To capitalize on this potential, they may have to commit considerable resources to develop and enhance new products and services; construct and expand production facilities; build operating capabilities; invest in systems, infrastructure, and distribution networks that will support global relationships; and nurture and develop customer relationships. Businesses in the growth stage may actually operate with negative cash flows and low current returns on invested capital (whether one expenses investments in intangible assets or capitalizes them for internal purposes). The investments being made for the future may consume more cash than can currently be generated by the limited base of existing products, services, and customers. The overall financial objective for growth-stage businesses will be percentage

growth rates in revenues, and sales growth rates in targeted markets, customer groups, and regions.

Probably the majority of business units in a company will be in the *sustain* stage, where they still attract investment and reinvestment, but are required to earn excellent returns on invested capital. These businesses are expected to maintain their existing market share and perhaps grow it somewhat from year to year. Investment projects will be directed more to relieving bottlenecks, expanding capacity, and enhancing continuous improvement, rather than the long payback and growth option investments that were made during the growth stage.

Most business units in the sustain stage will use a financial objective related to profitability. This objective can be expressed by using measures related to accounting income, such as operating income and gross margin. These measures take the capital invested in the business unit as given (or exogenous) and ask the managers to maximize the income that can be generated from the invested capital. Other, more autonomous business units, are asked not only to manage income flows but also the level of invested capital in the business unit. The measures used for these business units relate accounting income earned to the level of capital invested in the business unit; measures such as return-on-investment, return-on-capital-employed, and economic value-added are representative of those used to evaluate the performance of such business units.

Some business units will have reached a mature phase of their life cycle, where the company wants to *harvest* the investments made in the two earlier stages. These businesses no longer warrant significant investment—only enough to maintain equipment and capabilities, not to expand or build new capabilities. Any investment project must have very definite and short payback periods. The main goal is to maximize cash flow back to the corporation. The overall financial objectives for harvest-stage businesses would be operating cash flow (before depreciation) and reductions in working capital requirements.

Thus, the financial objectives for businesses in each of these three stages are quite different. Financial objectives in the growth stage will emphasize sales growth—in new markets and to new customers and from new products and services—maintaining adequate spending levels for product and process development, systems, employee capabilities, and establishment of new marketing, sales, and distribution channels. Financial objectives in the sustain stage will

emphasize traditional financial measurements, such as ROCE, operating income, and gross margin. Investment projects for businesses in this category will be evaluated by standard, discounted cash flow, capital budgeting analyses. Some companies will employ newer financial metrics, such as economic value-added and shareholder value. These metrics all represent the classic financial objective—earn excellent returns on the capital provided to the business. And the financial objectives for the harvest businesses will stress cash flow. Any investments must have immediate and certain cash paybacks. Accounting measurements—such as return-on-investment, economic value-added, and operating income—are less relevant since the major investments have already been made in these business units. The goal is not to maximize return-on-investment, which may encourage managers to seek additional investment funds based on future return projections. Rather, the goal is to maximize the cash that can be returned to the company from all the investments made in the past. There will be virtually no spending for research or development or to expand capabilities because of the short time remaining in the economic life of business units in the harvest phase.

The development of a Balanced Scorecard, therefore, must start with an active dialogue between the CEO of the business unit and the CFO of the corporation about the specific financial category and objectives for the business unit. This dialogue will identify the role for the business unit in the company's portfolio. Of course, this dialogue requires that the company CEO and CFO have an explicit financial strategy for each business unit. The positioning of divisions in a financial category is not immutable. A normal progression, which could occur over decades, moves units from growth, to sustain, to harvest, and finally to exit.<sup>4</sup> But occasionally, a business even in a mature, harvest stage might unexpectedly find itself with a growth objective. A sudden technological, market, or regulatory change may take what had previously been a mature, commoditized product or service, and transform it into one with high-growth potential. Such a transformation would completely shift the financial and investment objectives for the business unit. That is why the financial objectives for all business units should be reviewed periodically, probably at least annually, to reaffirm or change the unit's financial strategy.

## ***Risk Management***

Effective financial management must address risk as well as return. Objectives relating to growth, profitability, and cash flow emphasize improving returns from investment. But businesses should balance expected returns with the management and control of risk. Thus, many businesses include an objective in their financial perspective that addresses the risk dimension of their strategy—for example, diversifying revenue sources away from a narrow set of customers, one or two lines of business, or particular geographical regions. In general, risk management is an overlay, an additional objective that should complement whatever expected return strategy the business unit has chosen.

## ***Strategic Themes for the Financial Perspective***

We have found that, for each of the three strategies of growth, sustain, and harvest, there are three financial themes that drive the business strategy:

- Revenue growth and mix
- Cost reduction/productivity improvement
- Asset utilization/investment strategy

Revenue growth and mix refer to expanding product and service offerings, reaching new customers and markets, changing the product and service mix toward higher-value-added offerings, and repricing products and services. The cost reduction and productivity objective refers to efforts to lower the direct costs of products and services, reduce indirect costs, and share common resources with other business units. For the asset utilization theme, managers attempt to reduce the working capital levels required to support a given volume and mix of business. They also strive to obtain greater utilization of their fixed asset base, by directing new business to resources currently not used to capacity, using scarce resources more efficiently, and disposing of assets that provide inadequate returns on their market value. All these actions enable the business unit to increase the returns earned on its financial and physical assets.

To view the selection of the drivers of aggregate financial objectives as cells in a 3 × 3 matrix across the three business strategies and the three financial themes, see Figure 3-1.

### **REVENUE GROWTH AND MIX**

The most common revenue growth measure, both for growth- and harvest-stage business units, would be sales growth rates and market share for targeted regions, markets, and customers.

### **New Products**

Growth-stage businesses will usually emphasize expansions of existing product lines or offering entirely new products and services. A common measure for this objective is the percentage of revenue from new products and services introduced within a specified period, say two to three years. This measure has been extensively used by innovative companies, like Hewlett-Packard (HP) and the 3M Corporation. Of course, like any good measure, this objective can be achieved in both good and less good ways. The preferred way is for the new product or new product extension to be a dramatic improvement on existing offerings so that it captures new customers and markets, not just replaces sales of existing products. But if too much pressure is placed on this measure alone (less of a danger with a Balanced Scorecard), a business unit could score well on this measure by making a continuing series of incremental improvements that replace existing products but none of which offers distinct advantages to customers. Or, alternatively, and more dysfunctionally (and, fortunately, much less likely), a business unit could simply cease selling a high-volume mature product, allowing recent product sales to represent a higher fraction of total sales. To capture whether the new product or service represents a distinct improvement from existing offerings, some companies focus on the prices or gross margins from new products and services, anticipating that offerings with significantly more functionality and customer value will likely command a higher margin than mature existing products.

*Figure 3-1 Measuring Strategic Financial Themes*

|                        |         | Strategic Themes                                                                                                                                  |                                                                                             |                                                                                                        |
|------------------------|---------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
|                        |         | Revenue Growth and Mix                                                                                                                            | Cost Reduction/Productivity Improvement                                                     | Asset Utilization                                                                                      |
| Business Unit Strategy | Growth  | Sales growth rate by segment<br>Percentage revenue from new product, services, and customers                                                      | Revenue/Employee                                                                            | Investment (percentage of sales)<br>R&D (percentage of sales)                                          |
|                        | Sustain | Share of targeted customers and accounts<br>Cross-selling<br>Percentage revenues from new applications<br>Customer and product line profitability | Cost versus competitors'<br>Cost reduction rates<br>Indirect expenses (percentage of sales) | Working capital ratios (cash-to-cash cycle)<br>ROCE by key asset categories<br>Asset utilization rates |
|                        | Harvest | Customer and product line profitability<br>Percentage unprofitable customers                                                                      | Unit costs (per unit of output, per transaction)                                            | Payback<br>Throughput                                                                                  |

### New Applications

Developing entirely new products can be very costly and time-consuming for companies, especially those in the pharmaceutical and agricultural chemical industries, with long product-development cycles, and whose products must pass through stringent governmental regulatory approval processes. Businesses in the sustain stage may find it easier to grow revenues by taking existing products and finding new applications for them—new diseases or ailments for which a drug is effective, or new crops for which a chemical offers comparable protection. Taking existing products to new applications requires that a company demonstrate effectiveness in the new application, but the basic chemistry does not have to be invented, its safety demonstrated, or its manufacturing process developed and debugged. If new product applications is an objective, the percentage of sales in new applications would be a useful BSC measure.

### New Customers and Markets

Taking existing products and services to new customers and markets also can be a desirable route for revenue growth. Measures such as

percentage of revenues from new customers, market segments, and geographic regions would emphasize the importance of investigating this source of revenue enhancement. Many industries have excellent information on the size of the total market and of relative market shares by participants. Increasing a unit's share of targeted market segments is a frequently used metric; it also enables the unit to assess whether its market share growth is from improved competitive offerings or just growth in the total size of the market. Gaining sales but losing share may indicate problems with the unit's strategy or the attractiveness of its products and services.

### **New Relationships**

Some companies have attempted to realize synergies from their different strategic business units by having them cooperate to develop new products or to sell projects to customers. Whether the company strategy is to increase technology transfer across divisions or to increase sales to individual customers from multiple business units within the company, the objective can be translated into the amount of revenue generated from cooperative relationships across multiple business units.

For example, Rockwater was one of six engineering divisions within Brown & Root Energy Services. The other divisions all supplied engineering services of some type, typically to large oil and gas companies, with the services ranging across basic and applied engineering design, pipeline fabrication, pipeline installation (Rockwater), and pipeline maintenance and services. Historically, these divisions had operated as independent companies. When Norman Chambers was promoted from president of Rockwater to president of Brown & Root Energy Services, he asked that each company adopt, as a financial objective, an increase in the share of business won by collaboration. His long-term goal was to offer turnkey service to customers: from initial project design through long-term operations and maintenance of hydrocarbon pipeline facilities.

These examples mirror the experience of several businesses that are attempting to break away from undifferentiated commodity-like selling arrangements, driven principally by price, to offering products and services that satisfy particular customers' needs. The businesses

may state that their strategy is to move to a more differentiated strategy. But if their financial measurements are only aggregate sales, profits, and ROCE, they may be achieving short-term financial targets but not succeeding in their strategy. They need to distinguish how much of their sales is coming from competitively priced offerings versus the sales made at a premium or through long-term relationships because of value-added features and services.

### **New Product and Service Mix**

Extending this idea, businesses may choose to increase revenues by shifting their product and service mix. For example, a business may feel that it has a substantial cost advantage in selected segments, where it can win business away from competitors by offering significantly lower prices. If it is following this low-cost strategy, it should measure the growth of sales in the targeted segments. Alternatively, a business may choose a more differentiated strategy, deemphasizing low-price offerings and attempting to shift its product and service mix more toward premium priced items. This business could choose to measure the growth in sales and the percentage of total sales in the premium segment. Metro Bank, for example, adopted a strategy to increase the number of fee-based products it sold and tracked the success of this strategy with a measure of revenue growth from these products and services.

### **New Pricing Strategy**

Finally, revenue growth, especially in mature, perhaps harvest-stage business units, may be realized by raising prices on products, services, and customers where revenues are not covering costs. Such situations are now much easier to detect as companies implement activity-based cost (ABC) systems that trace costs, profits, and even assets employed down to individual products, services, and customers. Some companies have discovered, especially for specialized, niche products or particularly demanding customers, that prices can be increased, or, equivalently, large discounts eliminated, without losing share, to cover the costs of features and services on currently unprofitable products

and customers. Profitability by product, service, and customer, or the percentages of unprofitable products and customers, provide signals (not necessarily the only signals) on the opportunity for repricing, or the success and failure of past pricing strategies. For highly homogeneous products and services, a simple price index, such as net revenue per ton, price per call, or price per unit, will reveal the trends in pricing strategy for the company and the industry.

## **COST REDUCTION/PRODUCTIVITY IMPROVEMENT**

In addition to establishing objectives for revenue growth and mix, a business may wish to improve its cost and productivity performance.

### **Increase Revenue Productivity**

Business units in the growth stage are unlikely to be heavily focused on cost reduction. Efforts to reduce costs through dedicated automation and standardized processes may conflict with the flexibility required to customize new products and services for new markets. Therefore, the productivity objective for growth-stage businesses should focus on revenue enhancement—say revenue per employee—to encourage shifts to higher-value-added products and services and to enhance the capabilities of the organization's physical and personnel resources.

### **Reduce Unit Costs**

For sustain-stage businesses, achieving competitive cost levels, improving operating margins, and monitoring indirect and support expense levels will contribute to higher profitability and return-on-investment ratios. Perhaps the simplest and clearest cost reduction objective is to reduce the unit cost of performing work or producing output. For firms with relatively homogeneous output, supplying a simple target for reducing cost per unit can suffice. A chemical company can establish targets for cost per gallon or cost per pound produced; a retail bank can aim for a lower cost per transaction

(processing a deposit or a withdrawal) and a decreased cost per customer account sustained; and an insurance company can measure cost per premium processed or per claim paid. Since the cost of performing activities or producing outputs may use resources and activities from many different departments in an organization, an activity-based process-oriented costing system will likely be required for accurate measurement of the unit cost of processing transactions and producing output.

### **Improve Channel Mix**

Some organizations have multiple channels by which customers can conduct transactions with them. For example, retail banking customers can transact manually with in-branch tellers, through automatic teller machines (ATMs), and electronically by phone and computer. The cost to the bank of processing transactions via these various channels is very different. For manufacturers, some ordering from suppliers can be done traditionally, with a purchasing person calling for bids from external suppliers, evaluating the bids, selecting the best one, and then negotiating terms of delivery. Alternatively, the manufacturer could establish long-term relationships with certified suppliers, provide electronic data interchange (EDI) between the manufacturing process and the supplier, with the supplier taking responsibility for providing the required goods on time and directly to the production process. The cost of an EDI transaction is much lower than a traditional purchase transaction performed manually. Thus, an especially promising method for reducing costs is to shift customers and suppliers from high-cost manually processed channels to low-cost electronic channels. If this cost-reduction strategy is deployed by a business unit, it can measure the percentage of business it transacts through the various channels, with a goal of shifting the mix from high- to low-cost channels. Thus, even without any efficiency improvements in the underlying processes (an unrealistically conservative assumption), just shifting to more efficient processing channels can significantly increase productivity and lower the cost of doing business.

### **Reduce Operating Expenses**

Many organizations are now actively trying to lower their selling, general, and administrative expenses.<sup>5</sup> The success of these efforts can be measured by tracking the absolute amount of these expenses or their percentage to total costs or revenues. For example, if managers feel that their support spending is too high relative to competitors' and relative to the customer benefits being generated, they could set objectives to reduce, say, administrative expenses as a percentage of sales, or distribution or marketing and selling expenses. Objectives to reduce spending and expenses levels, however, should be balanced, on the scorecard, by other measures, say of customer responsiveness, quality, and performance, so that cost cutting does not interfere with achieving important customer and internal process objectives.

We admit, however, not being completely comfortable with this type of measurement since it implicitly assumes that these expenses are a “burden” on the organization that must be contained and eliminated over time. Ideally, organizations should attempt to measure the outputs produced from their indirect and support resources. They should try not just to reduce the spending and supply of these resources, but to increase their effectiveness—more customers, more sales, more transactions processed, more new products, better processes—as well as the efficiency of the work done by these resources—how much output and benefits these resources produce for a given level of input resources. These productivity-like measurements require that the organization analyze the work being performed by support resources, attempt to quantify the output produced, and then derive measures of the quantity and quality of the output produced as well as the ratio of outputs produced to inputs consumed. Activity-based cost analysis provides just such a linkage between spending on indirect, support, and administrative resources, and the activities and business processes performed by these resources and the outputs they produce and service. Viewed from this perspective, the somewhat artificial distinction, prevalent in many organizations today, between direct and indirect costs can be eliminated.

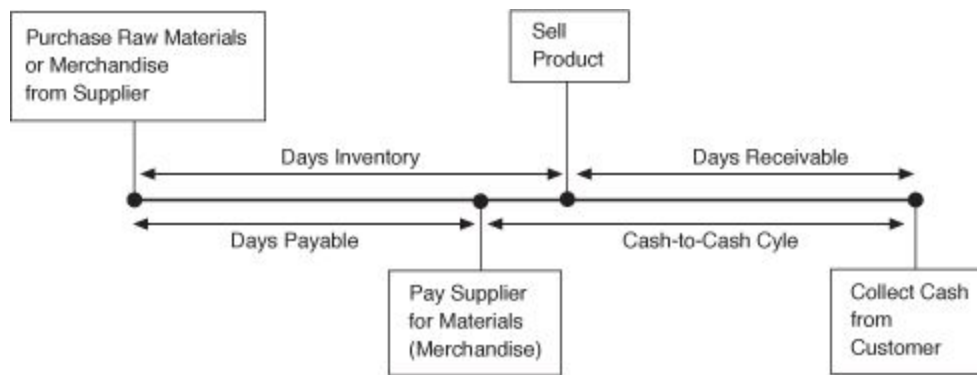
## **ASSET UTILIZATION/INVESTMENT STRATEGY**

Objectives, such as return-on-capital employed, return-on-investment, and economic value-added, provide overall outcome measures of the success of financial strategies to increase revenues, reduce costs, and increase asset utilization. Companies may also wish to identify the specific drivers they will use to increase asset intensity.

### **Cash-to-Cash Cycle**

Working capital, especially accounts receivable, inventory, and accounts payable, is an important element of capital for many manufacturing, retail, wholesale, and distribution companies. One measure of the efficiency of working capital management is the cash-to-cash cycle, measured as the sum of days cost-of-sales in inventory, days sales in accounts receivable, less days purchases in accounts payable (see Figure 3-2). The theory behind this measure is simple. The company purchases materials or products (and, for manufacturing companies, pays labor and conversion costs to produce finished goods). The length of time from when the purchases are made until they are sold represents the length of time capital is tied up in inventory. From this can be subtracted the length of time from purchasing materials and labor and conversion resources until cash payment must be made (the days purchases in accounts payable). The days sales in accounts receivable measures the length of time from when a sale is made until cash for it is received from customers. Thus the cash-to-cash cycle represents the time required for the company to convert cash payments to suppliers of inputs to cash receipts from customers. Some companies operate with negative cash-to-cash cycles; they pay suppliers after receiving cash from customers. In effect, by matching inventories extremely closely to final sales, collecting quickly from customers, and negotiating favorable terms with suppliers, they are able to supply, not consume, capital from their day-to-day operating cycle. While many companies will find it difficult, if not impossible, to have zero or negative cash-to-cash cycles, the goal of reducing the cash cycle from current levels can be an excellent target for improving working capital efficiency.

*Figure 3-2 Cash-to-Cash Cycle*



Companies with long operating cycles, such as construction companies, find it equally important to manage working capital. Such companies need to track progress payments against cash expended for work completed to date. Rockwater, the undersea construction company, had a particular problem with accounts receivable. It often had to wait more than 100 days before the customer made its final project payment. One of Rockwater's principal financial objectives was to significantly reduce the length of this close-out cycle, an objective that, if reached, would produce a dramatic improvement for its return-on-capital-employed, another one of its financial objectives.<sup>6</sup>

### **Improve Asset Utilization**

Other measures of asset utilization may focus on improving capital investment procedures, both to improve the productivity from capital investment projects and accelerate the capital investment process so that the cash returns from these investments are realized earlier; in effect, a reduction in the cash-to-cash cycle for investments in physical and intellectual capital.

Many of an organization's resources supply the infrastructure for accomplishing work: designing, producing, selling, and processing. These resources may require considerable capital investments. The investments certainly include physical capital, such as information systems, specialized equipment, distribution facilities, and other buildings and physical facilities. But the investments also include intellectual and human capital, such as skilled technologists, data bases, and market- and customer-knowledgeable personnel. Companies can increase the leverage from these infrastructure

investments by sharing them across multiple business units. Apart from the potential revenue benefits from sharing knowledge and customers, cost reductions can be achieved by not replicating similar forms of physical and intellectual assets across multiple units. Thus, companies attempting to achieve some economy of scale or scope across investments in specialized physical and intellectual capital can set objectives to increase the percentage of system resources that are shared with other business units.

Particular focus can be placed on the utilization of scarce and expensive resources. Again, returning to Rockwater, one of its largest asset investments were unique vessels that supported underwater construction activities. Rockwater set an objective to increase the percentage of vessel utilization time to highlight the importance of eliminating nonproductive time for this expensive resource. The same philosophy led a large integrated oil company to choose a measure of refinery utilization as one of its financial objectives.

Return-on-investment in intellectual assets, such as research and development, employees, and systems, will also increase an organization's overall return-on-investment. We, however, defer discussion of objectives for these intellectual assets to [Chapters 5 and 6](#), where we explicitly consider the objectives and measures for innovation, employees, and systems.

## ***Risk Management Objectives and Measures***

We have noted that, in addition to increasing returns—through growth, cost reduction, productivity, and asset utilization—most organizations are concerned with the risk and variability of their returns. When it is strategically important, these organizations will want to incorporate explicit risk management objectives into their financial perspective. Metro Bank chose a financial objective to increase the share of income arising from fee-based services not only for its revenue growth potential (as already mentioned) but also to reduce its current heavy reliance on income from core deposit and transaction-based products. Such income fluctuated widely with variations in interest rates. As the share of fee-based income increased, the bank believed that the year-to-year variability of its income stream would decrease. Thus, an objective to broaden revenue sources may serve both a growth and a risk management objective.

Risk is an essential part of the business of insurance companies, so National Insurance, a large property and casualty insurance company, included measures of loss exposure and reserve adequacy against maximum possible losses. A capital-intense company addressed its risk concerns by setting an objective that operating cash flow at the bottom of an economic cycle should still cover expenditures on physical capital maintenance and process and product improvement.

Some companies have recognized their generally poor record in forecasting actual operating results. Poor forecasts, especially when actual results were well below expected, led to unexpected borrowings and, therefore, higher risk to the businesses. These businesses chose an objective to reduce the percentage deviation between actual and projected results. Clearly, if this were the only measure in the financial perspective, managers would tend to issue conservative forecasts that they could easily fulfill. But since other financial objectives provided incentives to achieve stretch targets for revenue growth and return-on-assets, the forecast reliability objective could be balanced by growth and profitability objectives. Increasing backlogs of sales and orders was a risk-reducing objective chosen by one company that believed

that a large and growing backlog made revenue and forecasts more reliable.

## SUMMARY

Financial objectives represent the long-term goal of the organization: to provide superior returns based on the capital invested in the unit. Using the Balanced Scorecard does not conflict with this vital goal. Indeed, the Balanced Scorecard can make the financial objectives explicit, and customize financial objectives to business units in different stages of their growth and life cycle. Every scorecard we have seen uses traditional financial objectives relating to profitability, asset returns, and revenue enhancements. This evidence reinforces the strong links of the Balanced Scorecard to long-established business unit objectives.

Yet even staying within the financial perspective, the scorecard enables senior executives of business units to specify not only the metric by which the long-term success of the enterprise will be evaluated, but also the variables considered most important to create and to drive the long-term outcome objectives. The drivers in the financial perspective will be customized to the industry, the competitive environment, and the strategy of the business unit. We have suggested a classification scheme where businesses can choose financial objectives from themes relating to revenue growth, productivity improvement and cost reduction, asset utilization, and risk management.

Eventually, all objectives and measures in the other scorecard perspectives should be linked to achieving one or more objectives in the financial perspective, a theme we develop in [Chapter 7](#). This linkage to financial objectives explicitly recognizes that the long-run goal for the business is to generate financial returns to investors, and all the strategies, programs, and initiatives should enable the business unit to achieve its financial objectives. Every measure selected for a scorecard should be part of a link of cause-and-effect relationships, ending in financial objectives, that represents a strategic theme for the business unit. Used this way, the scorecard is not a group of isolated, unconnected, or even conflicting objectives. The scorecard should tell

the story of the strategy, starting with the long-run financial objectives, linking these to the sequence of actions that must be taken with financial processes, customers, internal processes, and finally employees and systems to deliver the desired long-term economic performance. For most organizations, the financial themes of increasing revenues, improving cost and productivity, enhancing asset utilization, and reducing risk can provide the necessary linkages across all four scorecard perspectives.

## NOTES

1. See, for example, G. Bennett Stewart, *The Quest for Value* (New York: Harper Business, 1991) and G. B. Stewart, "EVA™: Fact and Fantasy," *Journal of Applied Corporate Finance* (Summer 1994): 71–84.
2. C. W. Hofer and D. E. Schendel, *Strategy Formulation: Analytical Concepts* (St. Paul: West Publishing, 1978); I. C. MacMillan, "Seizing Competitive Initiative," *Journal of Business Strategy* (Spring 1982): 43–57; and P. Haspeslagh, "Portfolio Planning: Uses and Limits," *Harvard Business Review* (January–February 1982): 58–73.
3. This treatment was influenced by Ernest H. Drew, "Scaling the Productivity of Investment," *Chief Executive* (July/August 1993).
4. Some businesses no longer fit the strategic objectives of the company or can no longer generate adequate cash or financial returns. These businesses must be maintained just sufficiently for the company to implement an "exit" strategy, either through sale or an orderly shutdown. In the exit stage, financial measurements must focus on sustaining existing value. The measurements for business in this stage must be derived from a clear understanding with the company CEO and CFO about what is required to prepare the business for an orderly and value-maximizing sale. Factors that might jeopardize the marketability of the unit, such as growth in liabilities and creating waste, scrap, pollution, or disappointed customers, can all be closely monitored.
5. S. L. Mintz, "Spotlight on SG&A," *CFO Magazine* (December 1994): 63–65.
6. We discuss how Rockwater addressed its long payment-cycle problem in [Chapter 5](#), "Internal-Business-Process Perspective," since the solution required improving how project managers worked with customers. This example illustrates the importance of linking objectives across scorecard perspectives.



## Chapter Seven

# Linking Balanced Scorecard Measures to Your Strategy.

IN THE PREVIOUS FOUR CHAPTERS, we established the foundations for building a Balanced Scorecard. We described the construction of financial and nonfinancial measures, grouped into four perspectives: financial, customer, internal business process, and learning and growth. What makes for a successful Balanced Scorecard? Is it just having a mixture of financial and nonfinancial measures, grouped into four distinct perspectives?

The objective of any measurement system should be to motivate all managers and employees to implement successfully the business unit's strategy. Those companies that can translate their strategy into their measurement system are far better able to execute their strategy because they can communicate their objectives and their targets. This communication focuses managers and employees on the critical drivers, enabling them to align investments, initiatives, and actions with accomplishing strategic goals. Thus, a successful Balanced Scorecard is one that communicates a strategy through an integrated set of financial and nonfinancial measurements.

Why is it important to build a scorecard that communicates a business unit's strategy?

- The scorecard describes the organization's vision of the future to the entire organization. It creates shared understanding.

- The scorecard creates a holistic model of the strategy that allows all employees to see how they contribute to organizational success. Without such linkage, individuals and departments can optimize their local performance but not contribute to achieving strategic objectives.
- The scorecard focuses change efforts. If the right objectives and measures are identified, successful implementation will likely occur. If not, investments and initiatives will be wasted.

How can you tell when the scorecard is telling the story of the strategy? One test of whether a Balanced Scorecard truly communicates both the outcomes and the performance drivers of a business unit's strategy is its sensitivity and transparency. A scorecard should not only be derived from the organization's strategy; it should also be transparent back to the strategy. Observers should be able to look at the scorecard and see behind it, into the strategy that underlies the scorecard objectives and measures.

As an example, one division president reported to his company's president when he turned in his first Balanced Scorecard:

*In the past, if you had lost my strategic planning document on an airplane and a competitor found it, I would have been angry but I would have gotten over it. In reality, it wouldn't have been that big a loss. Or if I had left my monthly operating review somewhere and a competitor obtained a copy, I would have been upset, but, again, it wouldn't have been that big a deal. This Balanced Scorecard, however, communicates my strategy so well that a competitor seeing this would be able to block the strategy and cause it to become ineffective.*

When Balanced Scorecards exhibit this degree of transparency, they clearly have succeeded in translating a strategy into a linked set of performance measures.

## **LINKING THE BALANCED SCORECARD MEASURES TO STRATEGY**

How can we build a Balanced Scorecard that translates a strategy into measurements? We introduced, in [Chapter 2](#), three principles that enable an organization's Balanced Scorecard to be linked to its strategy:

1. Cause-and-effect relationships
2. Performance drivers
3. Linkage to financials

We discuss each of these principles in turn.

## ***Cause-and-Effect Relationships***

A strategy is a set of hypotheses about cause and effect. Cause-and-effect relationships can be expressed by a sequence of if-then statements. For example, a link between improved sales training of employees and higher profits can be established through the following sequence of hypotheses:

*If we increase employee training about products, then they will become more knowledgeable about the full range of products they can sell; if employees are more knowledgeable about products, then their sales effectiveness will improve. If their sales effectiveness improves, then the average margins of the products they sell will increase.*

A properly constructed scorecard should tell the story of the business unit's strategy through such a sequence of cause-and-effect relationships. The measurement system should make the relationships (hypotheses) among objectives (and measures) in the various perspectives explicit so that they can be managed and validated. It should identify and make explicit the sequence of hypotheses about the cause-and-effect relationships between outcome measures and the performance drivers of those outcomes. *Every measure selected for a Balanced Scorecard should be an element of a chain of cause-and-effect relationships that communicates the meaning of the business unit's strategy to the organization.*

## ***Outcomes and Performance Drivers***

As discussed in the previous four chapters, all Balanced Scorecards use certain generic measures. These generic measures tend to be core outcome measures, which reflect the common goals of many strategies, as well as similar structures across industries and companies. These generic outcome measures tend to be lag indicators, such as profitability, market share, customer satisfaction, customer retention, and employee skills. The performance drivers, the lead indicators, are the ones that tend to be unique for a particular business unit. The performance drivers reflect the uniqueness of the business unit's strategy; for example, the financial drivers of profitability, the market segments in which the unit chooses to compete, and the particular internal processes and learning and growth objectives that will deliver the value propositions to targeted customers and market segments.

A good Balanced Scorecard should have a mix of outcome measures and performance drivers. Outcome measures without performance drivers do not communicate how the outcomes are to be achieved. They also do not provide an early indication about whether the strategy is being implemented successfully. Conversely, performance drivers—such as cycle times and part-per-million defect rates—without outcome measures may enable the business unit to achieve short-term operational improvements, but will fail to reveal whether the operational improvements have been translated into expanded business with existing and new customers, and, eventually, to enhanced financial performance. *A good Balanced Scorecard should have an appropriate mix of outcomes (lagging indicators) and performance drivers (leading indicators) that have been customized to the business unit's strategy.*

## ***Linkage to Financials***

With the proliferation of change programs under way in most organizations today, it is easy to become preoccupied with such goals as quality, customer satisfaction, innovation, and employee empowerment for their own sake. While these goals can lead to improved business-unit performance, they may not if these goals are taken as ends in themselves. The financial problems of some recent Baldrige Award winners give testimony to the need to link operational improvements to economic results.

A Balanced Scorecard must retain a strong emphasis on outcomes, especially financial ones like return-on-capital-employed or economic value-added. Many managers fail to link programs, such as total quality management, cycle time reduction, reengineering, and employee empowerment, to outcomes that directly influence customers and that deliver future financial performance. In such organizations, the improvement programs have incorrectly been taken as the ultimate objective. They have not been linked to specific targets for improving customer and, eventually, financial performance. The inevitable result is that such organizations eventually become disillusioned about the lack of tangible payoffs from their change programs. *Ultimately, causal paths from all the measures on a scorecard should be linked to financial objectives.*

We can illustrate the applications of these three principles in two case studies: Metro Bank and National Insurance.

### **METRO BANK**

Metro Bank was confronted with two problems: (1) excessive reliance on a single product (deposits) and (2) a cost structure that made it unprofitable to service 80% of its customers at prevailing interest rates.

Metro embarked upon a two-pronged strategy to deal with these two problems:

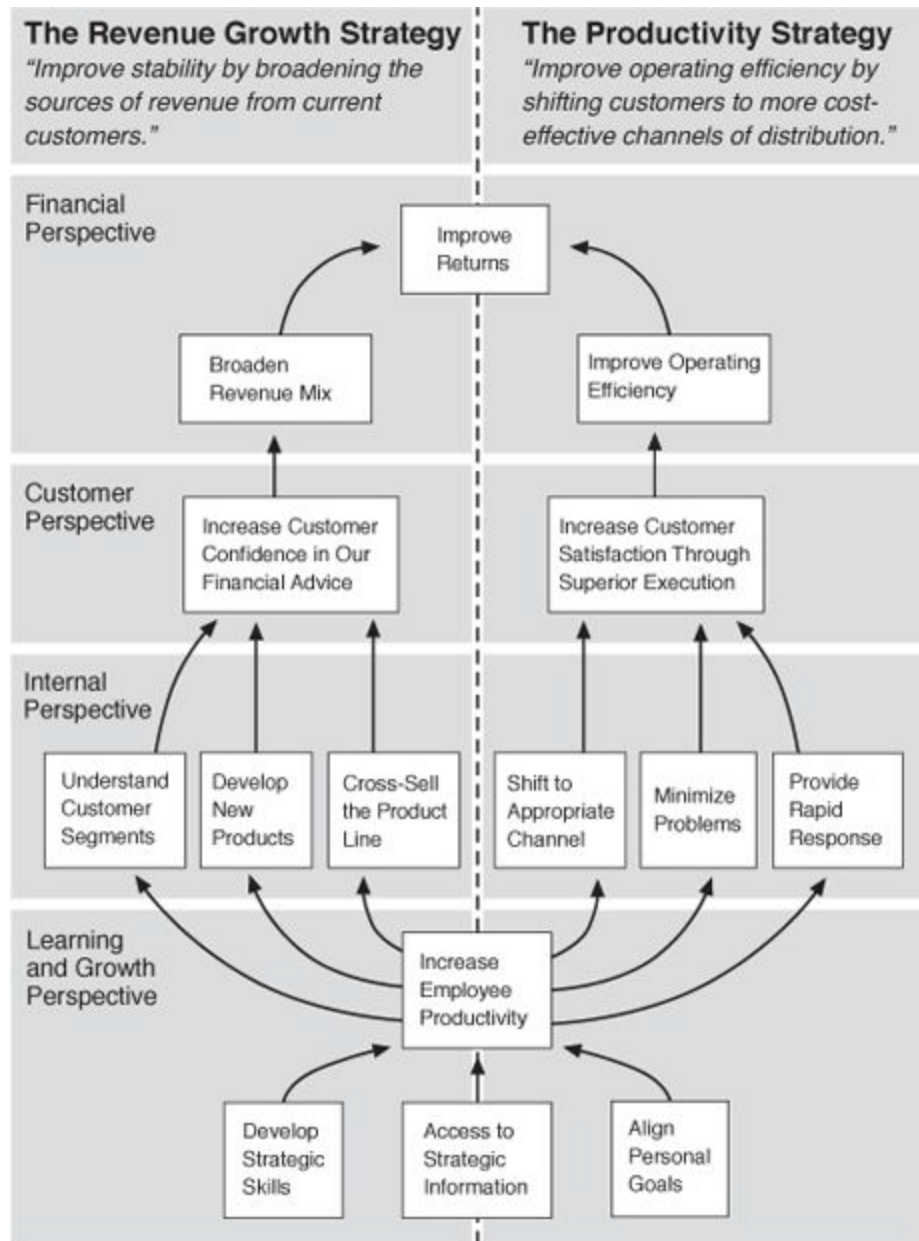
1. Revenue Growth. Reduce volatility of earnings by broadening the sources of revenue with additional products for current customers.
2. Productivity. Improve operating efficiency by shifting nonprofitable customers to more cost-effective channels of distribution (e.g., electronic banking).

The process of developing a Balanced Scorecard at Metro translated each of these strategies into objectives and measures in the four perspectives. Particular emphasis was placed on understanding and describing the cause-and-effect relationships on which the strategy was based. A simplified version of the results of this effort is shown in Figure 7-1. For the revenue growth strategy, the financial objectives were clear: broaden the mix of revenues. Strategically, this meant that Metro would focus on its current customer base, identify the customers who would be likely candidates for a broader range of services, and then sell an expanded set of financial products and services to these targeted customers. When customer objectives were analyzed, however, Metro's executives determined that its targeted customers did not view the bank, or their banker, as the logical source for a broader array of products such as mutual funds, credit cards, mortgages, and financial advice. The executives concluded that if the bank's new strategy were to be successful, they must shift customers' perception of the bank from that of a transactions processor of checks and deposits to a financial adviser.

Having identified the financial objective, *broaden revenue mix*, and the new customer value proposition, *increase customer confidence in our financial advice*, dictated by the financial objective, the scorecard design process then focused on the internal activities that had to be mastered if the strategy were to succeed. Three cross-business processes were identified: (1) understand customers, (2) develop new products and services, and (3) cross-sell multiple products and

services. Each business process would have to be redesigned to reflect the demands of the new strategy. The selling process, for example, had historically been dominated by institutional advertising of the bank's services. Good advertising plus good location brought the customers to the banks. The branch personnel were reactive, helping customers open accounts and providing ongoing service. The bank did not have a selling culture. In fact, one study indicated that only 10% of a salesperson's time was spent with customers. The bank launched a major reengineering program to redefine the sales process. The new sales process was designed to create a relationship-selling approach where the salesperson became more of a financial adviser. Two measures of this process were included on the Balanced Scorecard. The cross-sell ratio—the average number of products sold to a household—measured selling effectiveness. This “lag indicator” would tell whether or not the new process was working. The second measure, hours spent with customers, was included to send a signal to salespersons throughout the organization of the new culture required by the strategy. A relationship-based sales approach could not work unless face time with customers increased. Hours with customers therefore was a lead indicator for the success of this piece of the strategy.

*Figure 7-1 The Metro Bank Strategy*



The internal objectives led naturally to a final set of factors, on improving employee effectiveness, to implement the revenue growth strategy. The learning and growth component of the scorecard identified the need for (1) salespersons to acquire a broader set of skills (to become a financial counselor with broad knowledge of the product line), (2) improved access to information (integrated customer files), and (3) realignment of the incentive systems to encourage the new behavior. The lag indicators included a productivity measure, average sales per salesperson, as well as the attitudes of the work force as

measured by an employee satisfaction survey. The lead indicators focused on the major changes that had to be orchestrated in the work force: (1) the upgrading of the skill base and qualified people—strategic job coverage ratio, (2) the access to information technology tools and data—strategic information availability ratio, and (3) the realignment of individual goals and incentives to reflect the new priorities—personal goal alignment.

These measures, in turn, provided the basis for introducing entirely new management processes. For example, consider the measure, strategic job coverage ratio. Every strategy for change, including Metro Bank's, ultimately requires a selected set of the work force to be reskilled and equipped to take on the new demands. The availability of these strategic competencies is either an asset (when you have them) or a liability (when you don't). Developing such intellectual assets is usually the longest-lead event for determining the ultimate success of the business unit's strategy. The most effective measure that we have found for strategic competencies, deceptive in its simplicity, is derived from the answers to three questions: (1) What are the required competencies?, (2) What currently exists?, and (3) What and how large is the gap? The strategic job coverage ratio measure defines the strategic liability (recall the gap displayed in Figure 6-4). While the measure is fundamental and simple, very few organizations are able to construct it because their human resource and planning systems are unable to answer the three questions posed above. The definition of this measure has caused several companies to redesign the basic structure of their staff development process. Figure 7-2 illustrates the relationship of the scorecard measures to the strategic initiative that was instituted to close the strategic job coverage gap. The logic of defining the strategic priorities and the measures that best describe it led to the redefinition of a basic management program required to execute the strategy. Had it not been for the construction of the Balanced Scorecard and the logical systems thinking that it fostered, these organizations would most likely not have addressed the staff deficiencies in such a focused way with such a sense of urgency.

*Figure 7-2 Increasing Employee Productivity*



Figure 7-3 summarizes the objectives and measures for Metro Bank's Balanced Scorecard, indicating the mixture of leading and lagging indicators. Not surprisingly, the financial and customer measures contain few lead indicators; most of the leading or driving indicators occur for the internal-business-process and learning and growth measures. Figures 7-1 and 7-3 show how Metro's scorecard describes a system of cause-and-effect relationships, incorporating a mix of leading and lagging indicators, all of which eventually point to improving future financial performance.

*Figure 7-3* Metro Bank's Balanced Scorecard

| Strategic Objectives                                                                                                                                                                                                                | Strategic Measurements                                                                                          |                                                                                                          |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                     | (Lag Indicators)                                                                                                | (Lead Indicators)                                                                                        |
| <b>Financial</b><br>F1 - Improve Returns<br>F2 - Broaden Revenue Mix<br>F3 - Reduce Cost Structure                                                                                                                                  | Return-on-Investment<br>Revenue Growth<br>Deposit Service Cost Change                                           | Revenue Mix                                                                                              |
| <b>Customer</b><br>C1- Increase Customer Satisfaction with Our Products and People<br>C2- Increase Satisfaction "After the Sale"                                                                                                    | Share of Segment<br>Customer Retention                                                                          | Depth of Relationship<br>Satisfaction Survey                                                             |
| <b>Internal</b><br>I1 - Understand Our Customers<br>I2 - Create Innovative Products<br>I3 - Cross-Sell Products<br>I4 - Shift Customers to Cost-Effective Channels<br>I5 - Minimize Operational Problems<br>I6 - Responsive Service | New Product Revenue<br>Cross-Sell Ratio<br>Channel Mix Change<br>Service Error Rate<br>Request Fulfillment Time | Product Development Cycle<br>Hours with Customers                                                        |
| <b>Learning</b><br>L1 - Develop Strategic Skills<br>L2 - Provide Strategic Information<br>L3 - Align Personal Goals                                                                                                                 | Employee Satisfaction<br>Revenue per Employee                                                                   | Strategic Job Coverage Ratio<br>Strategic Information Availability Ratio<br>Personal Goals Alignment (%) |

## NATIONAL INSURANCE COMPANY (LONG LAG TIMES)

The importance of linking outcome measures to performance drivers is perhaps most powerfully illustrated in the insurance industry. Insurance is an information- and measurement-intense industry characterized by long delays between the time that routine decisions are made and the corresponding outcomes occur. For example, the effectiveness of the central event of underwriting—evaluating a risk and pricing it—is not known until subsequent claims are made and resolved. The incidence of insured events and resolution through the claims process can take between two and five years, although in extreme cases, as in asbestos litigation, the exposure can go on for decades. In such a setting, having

a mixture of leading and lagging measures is vital for motivating and measuring business unit performance.

National Insurance was a major property and casualty insurance firm that had been plagued by unsatisfactory results for the past decade. A new management team was brought in to turn the situation around. Its strategy was to move the company away from its generalist approach—providing a full range of services to the full market—to that of a specialist, a company that would focus on more narrowly defined niches. The new senior executive team identified several key success factors for its new specialist strategy:

- Become better at understanding and targeting desired market segments;
- Better select, educate, and motivate agents to pursue these segments;
- Improve the underwriting process as the focal point for executing this strategy; and
- Better integrate information about claims into the underwriting process to improve market selectivity.

National's executives selected the Balanced Scorecard as the primary tool for the new management team to use to lead the turnaround. They selected the scorecard because they believed it would help clarify the meaning of the new strategy to the organization, and provide early feedback that the ship was turning.

In the first step, the executives defined the strategic objectives for the new specialist strategy, shown in the lefthand column of Figure 7-4. They selected measures to make each objective operational by gaining agreement on the answer to a simple question, "How would we know if National Insurance achieved this objective?" The answers to this question yielded the measures shown in the center column, "Core Outcomes," of Figure 7-4. The core outcome measures were also referred to as "strategic outcome measures" because they described the outcomes that the executives wished to achieve from each part of their new strategy.

Figure 7-4 The Balanced Scorecard at National Insurance

| Strategic Objectives                                                                                                                                           | Strategic Measurements                                                                          |                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                | Core Outcomes (Lag)                                                                             | Performance Drivers (Lead)                                                                                                               |
| <b>Financial</b><br>F1 - Meet Shareholder Expectations<br>F2 - Improve Operating Performance<br>F3 - Achieve Profitable Growth<br>F4 - Reduce Shareholder Risk | Return-on-Equity<br>Combined Ratio<br>Business Mix<br>Catastrophic Losses                       |                                                                                                                                          |
| <b>Customer</b><br>C1 - Improve Agency Performance<br>C2 - Satisfy Target Policyholders                                                                        | Acquisition/Retention (vs. plan)<br>Acquisition/Retention (by segment)                          | Agency Performance (vs. plan)<br>Policyholder Satisfaction Survey                                                                        |
| <b>Internal</b><br>I1 - Develop Target Markets<br>I2 - Underwrite Profitably<br>I3 - Align Claims with Business<br>I4 - Improve Productivity                   | Business Mix (by segment)<br>Loss Ratio<br>Claims Frequency<br>Claims Severity<br>Expense Ratio | Business Development (vs. plan)<br>Underwriting Quality Audit<br>Claims Quality Audit<br>Headcount Movement<br>Managed Spending Movement |
| <b>Learning</b><br>L1 - Upgrade Staff Competencies<br>L2 - Access to Strategic Information                                                                     | Staff Productivity                                                                              | Staff Development (vs. plan)<br>Strategic I/T Availability (vs. plan)                                                                    |

As with many outcome measures, the measures shown in the center column were the obvious ones that any company in the property and casualty insurance industry would be using. The scorecard would not be meaningful if such industry-specific measures did not appear, but these measures, by themselves, would be inadequate to signal the factors that would lead to superior performance within the industry. Having only industry-generic measures at this point in the scorecard development process highlighted an additional problem. Every one of the outcome measures was a lagging indicator, the reported results for any of the measures reflected decisions and actions taken much earlier. For example, if new underwriting criteria were implemented, the results would not be reflected in the claims frequency for at least a year; the impact on the loss ratio would occur with an even longer delay.

The strategic outcome measures presented a “balanced” view of the strategy, reflecting customer, internal process, and learning and growth measures, in addition to the traditional financial ones. But a

scorecard consisting only of lagging indicators would not satisfy management's goal of providing early indicators of success. Nor would it help to focus the entire organization on the drivers of future success: what people should be doing day-by-day to produce successful outcomes in the future. While the issue of balancing lagging outcome measures with leading performance driver measures occurs for all organizations, the extremely long lags between actions today and outcomes in the future was more pronounced in the property and casualty insurance company than in any other we have encountered.

National Insurance executives went through a second design iteration to determine the actions that people should be taking in the short term to achieve the desired long-term outcomes. For each strategic outcome measure, they identified a complementary performance driver—see righthand column of Figure 7-4. In most cases, the performance drivers described how a business process was intended to change. For example, the strategic outcome measures for the underwriting process were:

- Loss ratio
- Claims frequency
- Claims severity

Improving performance of these measures required a significant improvement in the quality of the underwriting process itself. The executives developed criteria for what they considered good underwriting. The criteria defined the actions desired in underwriting a new opportunity. The executives introduced a new business process, to audit, periodically, a cross-section of policies for each underwriter to assess whether the policies issued by the underwriter conformed to these criteria. The audit would produce a measure, the underwriting quality audit score, that would show the percentage of new policies written that met the standards of the redesigned underwriting process. The theory behind this approach is that the underwriting quality audit score would be the leading indicator, the performance driver, of the outcomes—loss ratio, claims frequency, and claims severity—that would be revealed much later. In addition to the underwriting quality audit, similar programs were developed for outcome objectives related

to agency management, new business development, and claims management. New metrics, representing performance drivers for these outcomes were constructed to communicate and monitor near-term performance. These included:

| <b>Outcome Measure</b>          | <b>Performance Driver Measures</b>             |
|---------------------------------|------------------------------------------------|
| Key agent acquisition/retention | Agency performance versus plan                 |
| Customer acquisition/retention  | Policyholder satisfaction survey               |
| Business mix (by segment)       | Business development versus plan               |
| Claims frequency and severity   | Claims quality audit                           |
| Expense ratio                   | Headcount movement; indirect spending          |
| Staff productivity              | Staff development versus plan; IT availability |

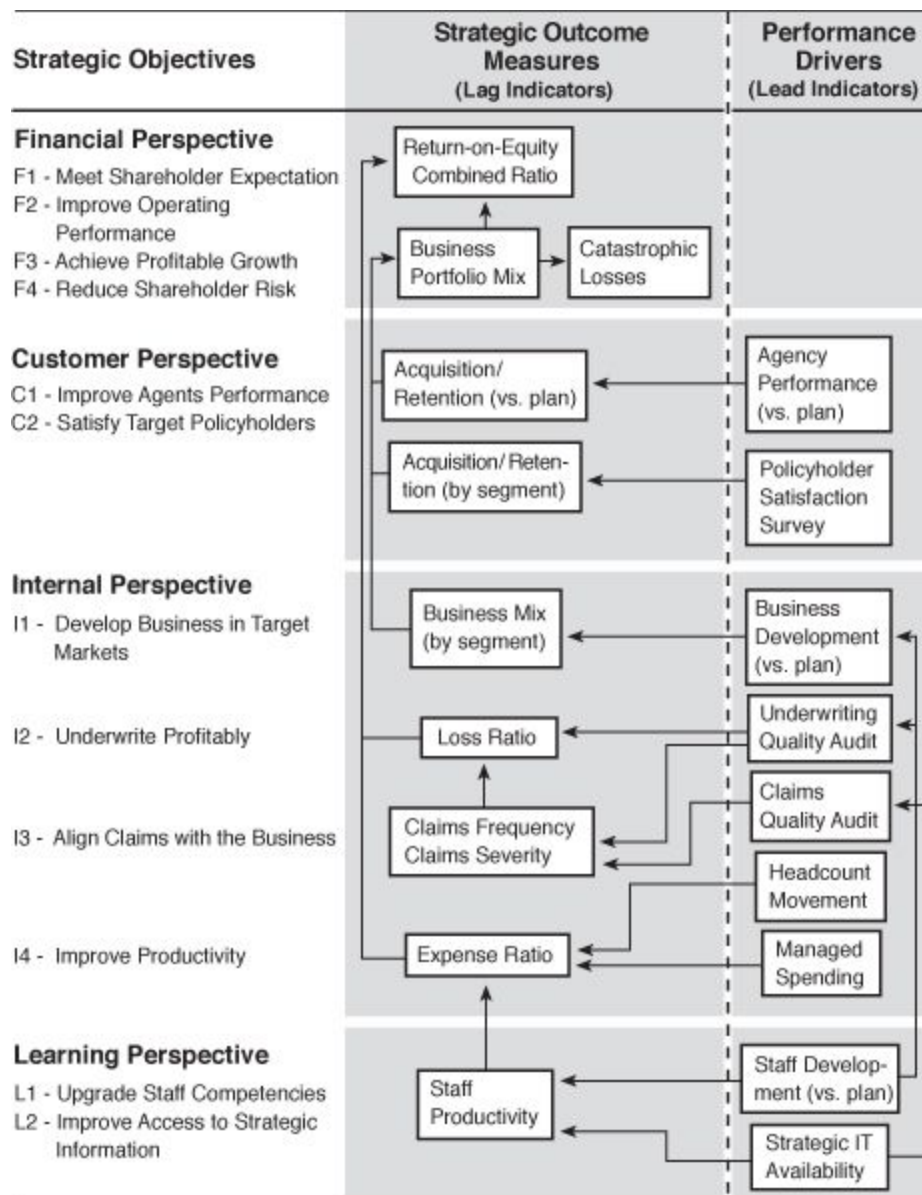
The righthand column of Figure 7-4 shows the new set of leading indicators, the performance drivers, selected by National Insurance.

Figure 7-5 presents the Balanced Scorecard graphically, illustrating two directional chains of cause and effect: from learning and growth and internal-business-process objectives to customer and financial objectives; and with each outcome measure in the customer, internal, and learning perspectives linked to a performance driver measure.

The National Insurance case again illustrates how the process of building a Balanced Scorecard creates change and produces results. Development of the metrics for the performance drivers forced executives to think through the way that work should be done in the future, and to introduce entirely new business processes—the underwriting quality audit, the claims quality audit, and specific programs to enhance staff skills and expand information technology to employees. In addition to providing measures for the scorecard, the criteria developed by the executives for the underwriting quality and claims quality audits helped develop improved underwriting and claims processes that could be communicated to the work force. The underwriting and claims quality audit scores were not off-the-shelf

measures. The executives developed customized measures to reflect the new underwriting and claims processes they wished to implement at National Insurance.

Figure 7-5 National Insurance—Cause-and-Effect Relationships



The detailed contents of the measures described National's strategy for success. The chain of cause-and-effect relationships diagrammed in Figure 7-5 represents the executives' hypotheses about the relationship of processes and decisions done today that were expected to favorably

impact various core outcomes in the future. The underwriting and claims quality audit measures were not intended to be used punitively. The action after revelation of poor underwriting or claims-processing performance would be additional training, not dismissal. Therefore, the measures were intended to communicate the specifics of new work processes to the organization. The logical process of identifying the strategic priority, the strategic outcomes, and the performance drivers led to reengineered business processes. The process of measurement was indeed “the tail that wagged the dog” (of operations).

The ultimate success of this turnaround program at National Insurance will take some time to play out (we describe the evolution of the Balanced Scorecard at National Insurance in [Chapter 12](#)), and will, of course, be influenced by many factors beyond the measurement system. But executives readily concurred that the Balanced Scorecard has been a major part of their turnaround strategy and near-term success. The scorecard, by providing short-term indicators of long-term outcomes, has become National Insurance’s guidance system to the future.

The Metro Bank and National Insurance cases illustrate the translation of an SBU business strategy into a measurement framework. In this macro-level design process, we have emphasized the importance of specifying the relationships among the measures as a basis for describing the strategy more than the construction of the individual measures themselves. Having established this overall strategic framework, however, the design and selection of specific measures or subsets of measures is where the execution of strategy begins. The Balanced Scorecard is not really a strategy formulation tool. We have implemented scorecards in organizations where the strategy has already been well articulated and accepted in the organization. But, more often we have found that even when the senior executive team thought it had prior agreement on the business unit’s strategy, the translation of that strategy into operational measurements forced the clarification and redefinition of the strategy. In effect, the disciplined measurement framework enforced by the Balanced Scorecard stimulated a new round of dialogue about the specific meaning and implementation of the strategy. It is this debate that usually leads to elevating specific management processes into matters of strategic necessity.

Having a linked set of performance measures also enables organized learning at the executive level. By making explicit the cause-and-effect hypotheses of a strategy, managers can test their strategy and adapt as they learn more about the implementation and effectiveness of their strategy, a theme that we explicate in greater detail in [Chapter 12](#). Without explicit cause-and-effect linkages, no strategic learning can occur.

## STRATEGIC VERSUS DIAGNOSTIC MEASURES: HOW MANY MEASURES ON A BALANCED SCORECARD?

Considering that each of the four perspectives in the Balanced Scorecard can require between four and seven separate measures, businesses often have scorecards with up to 25 measures. Are 25 measures too many? Is it possible for any organization to focus on 25 separate things? The answer to both questions is NO! If a scorecard is viewed as 25 (or even 10) independent measures, it will be too complicated for an organization to absorb.

The Balanced Scorecard should be viewed as the instrumentation for a *single* strategy. When the scorecard is viewed as the manifestation of one strategy, the number of measures on the scorecard becomes irrelevant, for the multiple measures on the Balanced Scorecard are linked together in a cause-and-effect network that describes the business unit's strategy. While this is easier said than done, the examples of Metro Bank and National Insurance, as well as our experience with other companies, indicate that companies can indeed formulate and communicate their strategy with an integrated system of approximately two dozen measurements.

But today most organizations already have many more than 16 to 25 measures to keep themselves functioning. They are incredulous that a Balanced Scorecard of no more than two dozen measures can be sufficient for measuring their operations. They are, of course, correct in a narrow sense, but they fail to distinguish between *diagnostic measures*<sup>1</sup>—those measures that monitor whether the business remains in control and can signal when unusual events are occurring that require immediate attention—and *strategic measures*—those that define a strategy designed for competitive excellence.

A simple example clarifies this point. Many aspects of our bodily functions must perform within fairly narrow operating parameters if we

are to survive. If our body temperature departs from a normal 1–2° window (away from 98.6°F or 37°C), or our blood pressure drops too low or escalates too high, we have a serious problem. In such circumstances, all our energies (and those of skilled professionals) are mobilized to restore these parameters to their normal levels. But we don't devote enormous energy to optimizing our body temperature and blood pressure. Being able to control our body temperature to within 0.01 of the optimum will not be one of the strategic success factors that will determine whether we become a chief executive of a company, a senior partner in an international consulting firm, or a tenured full professor at a major university. Other factors are more decisive in determining whether we achieve our unique personal and professional objectives. Are body temperature and blood pressure important? Absolutely. Should these measurements fall outside certain control limits, we have a signal about a major problem that we must attend to and solve immediately. But while such measurements are necessary, they are not sufficient for the achievement of our long-run goals.

Similarly, corporations should have hundreds, perhaps thousands, of measures that they can monitor to ensure that they are functioning as expected, and to signal when corrective action must be taken. But these are not the drivers of competitive success. Such measures capture the necessary “hygiene factors” that enable the company to operate. These measures should be monitored diagnostically, with deviations from expectations noted rapidly; in effect, management by exception.

The outcome and performance driver measures on the Balanced Scorecard, in contrast, should be the subjects of intensive and extensive interactions among senior and mid-level managers as they evaluate strategies based on new information about competitors, customers, markets, technologies, and suppliers.<sup>2</sup> After he had implemented his first Balanced Scorecard one executive remarked: “Our division had always measured hundreds of operating variables. In building a Balanced Scorecard, we chose 12 measures as the key to implementing our strategy. Of these 12 measures, 7 were entirely new measurements for the division.”<sup>3</sup>

The Balanced Scorecard is not a replacement for an organization's day-to-day measurement system. The scorecard measures are chosen

to direct the attention of managers and employees to those factors expected to lead to competitive breakthroughs for an organization.

## **HOW BAD THINGS HAPPEN TO GOOD MEASURES: USING DIAGNOSTIC MEASURES TO BALANCE STRATEGIC MEASURES**

Even the best objectives and measures can be achieved in bad ways. The Balanced Scorecard guards against some of the myopic suboptimization that occurs when only a single measure, especially a financial one, is used to motivate and evaluate business unit performance. But suboptimization is not unique to financial measures. For example, many companies use, in their customer perspective, the on-time delivery performance for targeted customers. On-time delivery has become an especially valued attribute by companies, especially manufacturers operating under a just-in-time discipline, where little inventory is held to buffer unreliable deliveries. Yet if too much pressure is placed on a single customer metric like OTD, managers could soon develop dysfunctional methods to achieve excellent OTD. For example, manufacturers can build a substantial inventory of all likely requested items so that almost any request could be filled by shipments from finished-goods inventory. For such companies, the OTD measure might be excellent but large amounts of capital would be tied up in inventory, storage, and handling facilities, and the company would run a high risk of obsolescence and spoilage. This is a very expensive way to achieve high OTD levels.

Alternatively, companies could achieve high OTD simply by quoting and committing to long lead times. For example, a customer might request delivery within 18 days. The company, because of backlogs, delays, and general confusion within its operations, may realize that it cannot deliver within 18 days, and offers the customer delivery only by day 30. The customer may not be happy with the extension, but in the short run may not have an alternative supplier for the good or service, and therefore accepts the 30-day delivery commitment. If the company does, in fact, deliver on day 30, it has satisfied its OTD objective, but it has not satisfied the customer that requested delivery on day 18.

Consider, as another example, an excellent performance measure for the innovation cycle of the internal-business-process perspective: the time-to-market measure for new products and services. Business units hope to improve their time-to-market by improving the management of their new-product introduction process, and by learning to produce the finished product with fewer design cycles, for example. But, lacking fundamental improvement in new-product introduction processes, and under the discipline of adhering to a demanding time-to-market performance measure, managers can release new products that are only incrementally different from existing products. They have achieved their performance target, but at the expense of fundamental innovation that has placed a competitive strength at risk.

A company's total measurement system should not encourage suboptimization along any single measure or perspective. Designers should attempt to anticipate the suboptimization that might occur for a given metric on the Balanced Scorecard, and provide supplemental metrics that discourage achieving the primary scorecard objective in undesirable ways. Rather than clutter up the scorecard with additional, nonstrategic measures, companies can use diagnostic measures to balance the strategic measures on the scorecard. As a specific example, Analog Devices, a prototype company for the Balanced Scorecard,<sup>4</sup> wanted to offset the temptation to achieve high OTD through long-lead-time quotes. Therefore, in addition to OTD, Analog measured the difference between the promised delivery date and the customer's requested delivery date. It also measured the percentage of time it could not commit to the customer's requested delivery date. It could also have used a diagnostic measure like inventory turns ratio to offset the temptation to achieve excellent OTD performance by carrying lots of inventory. The off-scorecard diagnostic measures like inventory turns and the difference between customer requested delivery dates and quoted delivery dates enable managers to detect when improved on-time delivery performance has been achieved by undesirable actions.

## **SUMMARY**

Balanced Scorecards need to be more than a mixture of 15 to 25 financial and nonfinancial measures, grouped into four perspectives. The scorecard should tell the story of the business unit's strategy. This story is told by linking outcome and performance driver measures together via a series of cause-and-effect relationships. The outcome measures tend to be lagging indicators. They signal the ultimate objectives of the strategy and whether near-term efforts have led to desirable outcomes. The performance driver measures are leading indicators, which signal to all organizational participants what they should be doing today to create value in the future. Outcome measures without performance drivers create ambiguity about how the outcomes are to be achieved, and may lead to suboptimal short-term actions. Performance driver measures that are not linked to outcomes will encourage local improvement programs that may deliver neither short- nor long-term value to the business unit. The best Balanced Scorecards will tell the story of the strategy so well that the strategy can be inferred by the collection of objectives and measures and the linkages among them.

## NOTES

1. For a description of diagnostic measures, see Chap. 4 in Robert Simons, *Levers of Control: How Managers Use Innovative Control Systems to Drive Strategic Renewal* (Boston: Harvard Business School Press, 1995).
2. The important distinction between the measures monitored in an organization's diagnostic control systems and those that are part of the continual interactions among managers as they scan and debate key strategic uncertainties has been articulated by Simons, *Levers of Control*.
3. Experience reported in "Implementing the Balanced Scorecard at FMC Corporation: An Interview with Larry D. Brady," *Harvard Business Review* (September–October 1993): 143–147.
4. Robert S. Kaplan, "Analog Devices, Inc.: The Half-Life System," 9-190-061 (Boston: Harvard Business School, 1990) and A. Schneiderman, "Metrics for the Order Fulfillment Process: Parts I and II," *Journal of Cost Management* (Summer 1996, Fall 1996).