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Conceptual Foundations of the Balanced Scorecard

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Abstract

David Norton and I introduced the Balanced Scorecard in a 1992 *Harvard Business Review* article (Kaplan & Norton, 1992). The article was based on a multi-company research project to study performance measurement in companies whose intangible assets played a central role in value creation (Nolan Norton Institute, 1991). Norton and I believed that if companies were to improve the management of their intangible assets, they had to integrate the measurement of intangible assets into their management systems.

After publication of the 1992 HBR article, several companies quickly adopted the Balanced Scorecard giving us deeper and broader insights into its power and potential. During the next 15 years, as it was adopted by thousands of private, public, and nonprofit enterprises around the world, we extended and broadened the concept into a management tool for describing, communicating and implementing strategy. This paper describes the roots and motivation for the original Balanced Scorecard article as well as the subsequent innovations that connected it to a larger management literature.

"Conceptual Foundations of the Balanced Scorecard"

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David Norton and I introduced the Balanced Scorecard in a 1992 *Harvard Business Review* article.[1] The article was based on a 1990 Nolan, Norton multi-company research project that studied performance measurement in companies whose intangible assets played a central role in value creation.[2] Our interest in measurement for driving performance improvements arose from a belief articulated more than a century earlier by a prominent British scientist, Lord Kelvin:[3]

> I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.
>
> If you can not measure it, you can not improve it.

Norton and I believed that measurement was as fundamental to managers as it was for scientists. If companies were to improve the management of their intangible assets, they had to integrate the measurement of intangible assets into their management systems.

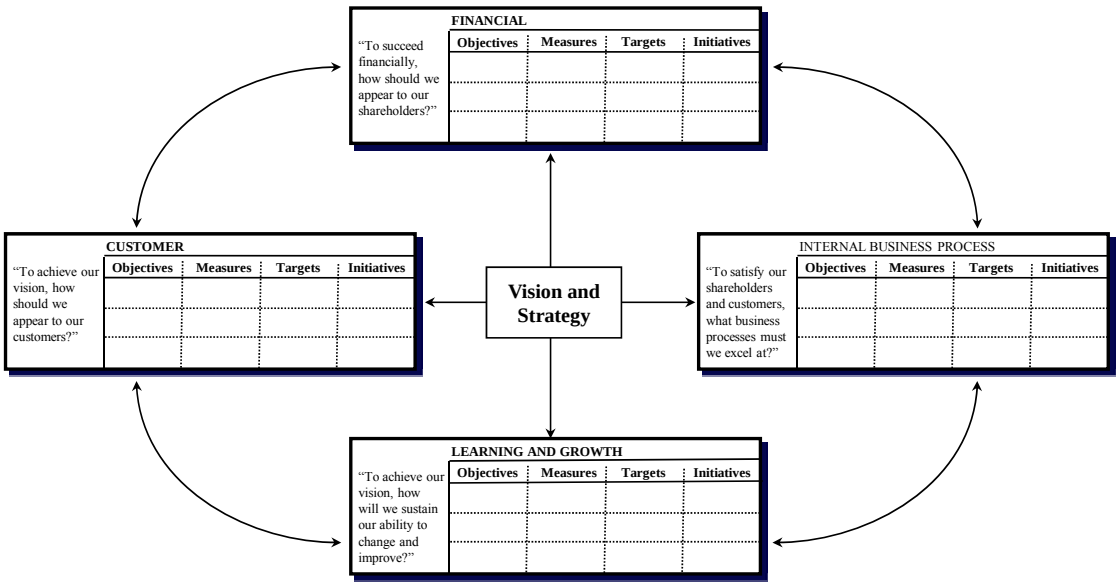
After publication of the 1992 HBR article, several companies quickly adopted the Balanced Scorecard giving us deeper and broader insights into its power and potential. During the next 15 years, as it was adopted by thousands of private, public, and nonprofit enterprises around the world, we extended and broadened the concept into a management tool for describing, communicating and implementing strategy. In this paper, I describe the roots and motivation for the original Balanced Scorecard article as well as the subsequent innovations that connected it to a larger management literature. The paper uses the following structure for organizing the origin and subsequent development of the Balanced Scorecard:

1. Balanced Scorecard for Performance Measurement
2. Strategic Objectives and Strategy Maps
3. The Strategy Management System
4. Future Opportunities

Balanced Scorecard for Performance Measurement

Figure 1 shows the original structure for the Balanced Scorecard (BSC). The BSC retains financial metrics as the ultimate outcome measures for company success, but supplements these with metrics from three additional perspectives – customer, internal process, and learning and growth – that we proposed as the drivers for creating long-term shareholder value.

Figure 1: Translating Vision and Strategy: Four Perspectives



1.1. Historical Roots: 1950-1980

The Balanced Scorecard, of course, was not original for advocating that nonfinancial measures be used to motivate, measure, and evaluate company performance. In the 1950s, a General Electric corporate staff group conducted a project to develop performance measures for

GE's decentralized business units (Lewis, 1955).[2] The project team recommended that divisional performance be measured by one financial and seven nonfinancial metrics.

1. Profitability (measured by residual income)
2. Market share
3. Productivity
4. Product leadership
5. Public responsibility (legal and ethical behavior, and responsibility to stakeholders including shareholders, vendors, dealers, distributors, and communities)
6. Personnel development
7. Employee attitudes
8. Balance between short-range and long-range objectives

One can see the roots of the Balanced Scorecard in these eight objectives. The financial perspective is represented by the first GE metric, the customer perspective with the second, the process perspective with metrics 3 -5, and the learning and growth perspective with metrics 6 and 7. The 8th metric captures the essence of the Balance Scorecard, encouraging managers to achieve a proper balance between short and long-range objectives. Unfortunately, the noble goals of the 1950s GE corporate project never got ingrained into the management system and incentive structure of GE's line business units. In fact, despite metrics 5 and 8 in the above list, several GE units were subsequently convicted of price-fixing schemes, with their managers claiming that corporate pressure for short-term profits led them to compromise long-term objectives and their public responsibilities.

At about the same time as the GE project, Herb Simon and several colleagues at the newly-formed Graduate School of Industrial Administration, Carnegie Institute of Technology (later Carnegie-Mellon University) identified several purposes for accounting information in organizations:

Scorecard questions: "Am I doing well or badly?"

Attention-directing questions: "What problems should I look into?"

Problem-solving questions: "Of the several ways of doing the job, which is the best?

[2] See also, General Electric (A), HBS Case Study

Simon and his colleagues explored the role for financial and nonfinancial information to inform these three questions. This study was perhaps the first to introduce the term "scorecard" into the performance management discussion.

Peter Drucker introduced management by objectives in his classic 1954 book, *The Practice of Management*. Drucker argued that all employees should have personal performance objectives that aligned strongly to the company strategy:

> Each manager, from the "big boss" down to the production foreman or the chief clerk, needs clearly spelled-out objectives. These objectives should lay out what performance the man's [sic] own managerial unit is supposed to produce. They should lay out what contribution he and his unit are expected to make to help other units obtain their objectives. […] These objectives should always derive from the goals of the business enterprise. […] [M]anagers must understand that business results depend on a balance of efforts and results in a number of areas. […] Every manager should responsibly participate in the development of the objectives of the higher unit of which his is a part. […] He must know and understand the ultimate business goals, what is expected of him and why, what he will be measured against and how (Drucker 1954, pp. 126-9).

Despite Drucker's insights and urgings, however, management by objectives in the next half-century mostly became a somewhat bureaucratic exercise, administered by the human resources department, based on local goal-setting that was operational and tactical, and rarely informed by business-level strategies and objectives. Companies at Drucker's time and for many years thereafter lacked a clear way of describing and communicating top-level strategy in a way that middle managers and front-line employees could understand and internalize.

In the mid-1960s, Robert Anthony, building upon the decade-earlier research by Simon et al, and on another article by Simon on programmed versus nonprogrammed decisions, proposed a comprehensive framework for planning and control systems. Anthony identified three different types of systems: strategic planning, management control, and operational control. Strategic planning was defined as:

> the process of deciding upon objectives, on changes in these objectives, on the resources used to attain these objectives, and on the policies that are to govern the acquisition, use, and disposition of these resources (Anthony 1965, p.16).

Foreshadowing the subsequent development of strategy maps, Anthony claimed that strategic planning depends "on an estimate of a cause-and-effect relationship between a course of action and a desired outcome," but concluded that, because of the difficulty of predicting such a relationship, "strategic planning is an art, not a science." Further, Anthony noted that strategic

planning is not accompanied by what we would today call strategic control, "Although strategic revision is important, top management spends relatively little time in this activity." Anthony also believed that information for strategic planning usually had a financial emphasis.

Anthony's second category, management control, concerned "the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" (Anthony 1965, p. 17). He observed that management control systems, with rare exceptions, have an underlying *financial* structure; that is, plans and results are expressed in monetary units … the only common denominator by means of which the heterogeneous elements of outputs and inputs can be combined and compared. He acknowledged, however,

> Although management control systems have financial underpinnings, it does not follow that money is the only basis of measurement, or even that it is the most important basis. Other quantitative measurements, such as […] market share, yields, productivity measures, tonnage of output, and so on, are useful. (Anthony 1965, p. 42)

Anthony described the third category, operational or task control, as "the process of assuring that specific tasks are carried out effectively and efficiently." He stated that information for operational control was mostly nonmonetary, though some information could be denominated in monetary terms (presumably, frequent variance reports on labor, machine, and materials quantity and cost variances).

Thus the roots of management planning and control systems encompassing both financial and nonfinancial measurement can be seen in these early writings of Simon, Drucker, and Anthony. Despite the advocacy of these scholars, however, the primary management system for most companies, until the 1990s, used financial information almost exclusively and relied heavily on budgets to maintain focus on short-term performance.

1.2. Japanese Management Movement: 1975-1990

During the 1970s and 1980s, innovations in quality and just-in-time production by Japanese companies challenged the Western leadership in many important industries. Several authors argued that Western companies' narrow focus on short-term financial performance contributed to their complacency and slow response to the Japanese threat. Johnson and Kaplan (1987) reviewed the history of management accounting and concluded that US corporations had become obsessed with short-term financial measures and had failed to adapt their management

accounting and control systems to the operational improvements from successful implementation of total quality and short-cycle-time management.

A Harvard Business School project on Council on Competitiveness (Porter, 1992) echoed these critiques when it identified the following systematic differences between investments made by US corporations versus those made in Japan and Germany:

> The US system is less supportive of investment overall because of its sensitivity to current returns … combined with corporate goals that stress current stock price over long-term corporate value.
>
> The US system favors those forms of investment for which returns are most readily measurable. … This explains why the United States underinvests, on average, in intangible assets [N.B., product and process innovation, employee skills, customer satisfaction] where returns are more difficult to measure.
>
> The US system favors acquisitions, which involve assets that can be easily valued over internal development projects that are more difficult to value. (Porter, 1992, p. 72-73).

Some accounting academics proposed methods by which a firm's spending to create intangible assets could be capitalized and placed as assets on the corporate Balance Sheet. During the 1970s, there was a burst of interest in human resources accounting (Flamholtz, 1974; Caplan and Landekich, 1975; Grove et al, 1977). Subsequently, Baruch Lev and his doctoral students and colleagues proposed that financial reporting could be more relevant if companies capitalized their expenditures on intangible assets or found other methods by which these assets could be placed on corporate Balance Sheets. While such a treatment is consistent with Lord Kelvin's (and our) advocacy of measurement to improve understanding and management, none of these approaches gained traction in actual companies. Several factors led to the lack of adoption of placing values for intangible assets on corporate Balance Sheets.

First, the value from intangible assets is indirect. Assets such as knowledge and technology seldom have a direct impact on revenue and profit. Improvements in intangible assets affect financial outcomes through chains of cause-and-effect relationships involving two or three intermediate stages. For example, consider the linkages in the service management profit chain (Heskett et al, 1994; Heskett, Sasser and Schlesinger, 1997), a development done in parallel and consistent with our Balanced Scorecard approach:

- investments in employee training lead to improvements in service quality
- better service quality leads to higher customer satisfaction
- higher customer satisfaction leads to increased customer loyalty

- increased customer loyalty generates increased revenues and margins.

Financial outcomes are separated causally and temporally from improving employees' capabilities. The complex linkages make it difficult if not impossible to place a financial value on an asset such as workforce capabilities or employee morale, much less to measures changes from period to period in such a financial value.

Second, the value from intangible assets depends on organizational context and strategy. This value cannot be separated from the organizational processes that transform intangibles into customer and financial outcomes. A corporate Balance Sheet is a linear, additive model. It records each class of asset separately and calculates the total by adding up each asset's recorded value. The value created from investing in individual intangible assets, however, is neither linear nor additive.

Senior investment bankers in a firm such as Goldman Sachs are immensely valuable because of their knowledge about complex financial products and their capabilities for managing relationships and developing trust with sophisticated customers. People with the same knowledge, experience, and capabilities, however, are nearly worthless to a financial services company such as etrade.com that emphasizes operational efficiency, low cost, and technology-based trading. The value of an intangible asset depends critically on the context – the organization, the strategy, and other complementary assets – in which the intangible asset is deployed.

Also, intangible assets seldom have value by themselves.[3] Generally, they must be bundled with other intangible and tangible assets to create value. For example, a new growth-oriented sales strategy could require new knowledge about customers, new training for sales employees, new databases, new information systems, a new organization structure, and a new incentive compensation program. Investing in just one of these capabilities, or in all of them but one, could cause the new sales strategy to fail. The value does not reside in any individual intangible asset. It arises from creating the entire set of assets along with a strategy that links them together. The value-creation process is multiplicative, not additive.

Rather than attempt a solution to the measurement and management of intangible assets within the financial reporting framework, several articles and books in the 1980s recommended that companies integrate nonfinancial indicators of their operating performance into their management accounting and control systems, e.g. Howell et al. (1987), Berliner and Brimson

[3] Brand names, which can be sold, are an exception.

(1991), Kaplan (1990). Some authors went further when they urged that internal reporting of financial information to managers and employees, especially those tasked with improving operations by continuous improvement of quality, process yields, and process cycle times, be abolished.

> Managing with information from financial accounting systems impedes business performance today because traditional cost accounting data do not track sources of competitiveness and profitability in the global economy. Cost information, per se, does not track sources of competitive advantage such as quality, flexibility and dependability. […] Business needs information about activities, not accounting costs, to manage competitive operations and to identify profitable products (Johnson, 1980, 44-5).

Essentially, these authors argued that companies should focus on improving quality, reducing cycle times, and improving companies' responsiveness to customers' demands. Doing these activities well, they believed, would lead naturally to improved financial performance.

The US Government in 1987 introduced the Malcolm Baldrige National Quality Award to promote quality awareness, recognize quality achievements, and publicize successful quality strategies. The initial set of Baldrige criteria included financial metrics (profits per employee), customer-perceived quality metrics (market cycle time, late deliveries), internal process metrics (defects, total manufacturing time, order entry time, supplier defects) and employee metrics (training per employee, morale). But in the early 1990s, several studies revealed that even businesses that had received the Baldrige Award for quality excellence could encounter financial difficulties, suggesting that the link, assumed by the academic scholars quoted above, between continuous process improvement and financial success was far from automatic.

During the late 1980's, I wrote several case studies that described how some companies had integrated well financial information with nonfinancial information on process quality and cycle times for front-line employees. In an operating department of a large chemical company,[4] a chemical-engineer department manager had introduced a daily income statement for the operators in his department. Even though the employees already had access (every 2-4 hours) to thousands of observations about operating parameters, throughput, and quality, the new daily income statement proved a big hit, and helped the employees set production records for throughput and quality. The daily income statement helped employees quickly assess the consequences from off-spec production or machine downtime, enabled them make trade-offs among conflicting demands on quality and throughput, and guided and justified their decisions about spending to improve quality and throughput.

[4] "Texas Eastman Company," HBS Case #9-190-039.

Another case described how a Big-3 automobile engine fabrication plant had made a deep commitment to total quality management principles. It provided decentralized work teams with continuous information about machine downtime and scrap to facilitate operational improvements at bottleneck machines and processes, and to eliminate the root causes of scrap and off-spec production. But in addition to the daily information on machine downtime, throughput and scrap (all nonfinancial measures), the work teams received a daily report on their spending on indirect materials, such as supplies, tools, scrap and maintenance materials, plus a weekly report on total overhead expenses charged to their departments, including telephone, utilities, indirect labor, and salaries of engineering and technical assistants. Plant management wanted the teams not only to improve quality and throughput but also to make decisions that could directly influence the costs being incurred in their departments.[5] These two cases revealed the power of complementing nonfinancial information with financial information, even for front-line production employees.

A third case, about a semiconductor company, Analog Devices, described how executives at the top of the organization benefited from seeing nonfinancial information. Analog Devices, like the chemicals plant and the Big-3 automobile engine plant, had introduced a highly successful quality management system, which included an innovative quality improvement metric.[6] In addition, Analog's vice president of quality and improvement, an experienced Baldrige Award examiner, had translated the Baldrige criteria into an internal corporate scorecard for his executive team. The corporate scorecard included some high-level financial metrics that the executive team had been accustomed to managing, but also the Baldrige quality metrics organized by three other perspectives:

- customer quality metrics, such as on-time delivery, lead time, and customer-measured defects
- manufacturing process metrics, such as yield, part-per-million defect rates, and cycle times
- employee metrics, such as absenteeism and lateness.

The Analog scorecard signaled that to make quality improvement a senior executive focus, the measurement system should be expanded beyond financial indicators to include an array of quality metrics relating to customers, manufacturing processes, and employees.

The three cases provided successful counter-examples to the various scholars and consultants who argued that front-line employees need see only nonfinancial indicators while

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5 "Romeo Engine Plant," Harvard Business School Case #9-194-032

6 "Analog Devices: The Half-Life System," HBS Case #9-190-061.

senior management can and should focus only on financial ones. The cases showed how front-line employees could benefit from seeing financial metrics, while senior executive teams benefited from supplementing their financial view of the world with metrics about customers, quality, and employees. Thus the stage was set for thinking about a general framework by which both senior-level executive teams and front-line production workers would receive financial and nonfinancial information.

1.3. Shareholder Value and the Principal-Agent Framework

Not all academics, however, had been exposed to the recent advances in operations management. Many remained focused on economics and finance, especially the efficient markets theory from the 1960s and early 1970s (Fama, 1971). Economists also introduced principal-agent theory (Jensen-Meckling, 1976, Harris-Raviv, 1979; Holmström, 1979, Grossman-Hart, 1983) to formalize the inherent conflict of interests between hired executive teams and the companies' dispersed shareholders (owners). The principal-agent adherents urged companies to provide more financial incentives to senior executive teams, especially incentives based on financial performance, the typical "outcome" measure assumed in principal-agent models. Efficient markets research; suggested that stock prices continually reflected all the relevant public information about companies' performance, and that executives' compensation could be better aligned with owners' interests through expanded use of stock options and other equity rewards (Jensen-Meckling, 1976; Fama-Jensen, 1983). In a similar vein, some argued for aligning compensation to better accounting surrogates of stock market performance, especially residual income under its new name, economic value added (Stewart, 1991).

The 1980s saw a huge increase in the linkage between executives' pay and incentives to financial performance. For the financial economists at the vanguard of this movement, the idea of senior executives paying attention to nonfinancial performance metrics was close to blasphemous. As Michael Jensen (2001), a leading financial economics scholar, has stated:

> Balanced Scorecard theory is flawed because it presents managers with a scorecard which gives no score – that is no single-valued measure how they have performed. Thus managers evaluated with such a system […] have no way to make principled or purposeful decisions.

I obviously agree with Jensen that managers cannot be paid by a set of unweighted performance metrics. Ultimately, if a company wants to set bonuses based on measured performance, it must reward based on a single measure (either a stock market or accounting-based metric) or provide a weighting among the multiple measures a manager has been instructed

to improve. But linking performance to pay is only one component of a comprehensive management system.

Consider an airplane where passengers contract with the pilot for a safe and on-time journey. One can imagine an airplane cockpit designed by a financial economist. It consists of a single instrument that displays the destination to be achieved and the desired time of arrival. Or, the pilot is given a more complex navigation instrument where the movement of the needle represented a weighted average of estimated time to arrival, fuel remaining, altitude, deviation from expected flight path, and proximity to other airplanes. Few of us would feel comfortable flying in a plane guided only by the single instrument even though the incentives of the pilot and the passengers for a safe, on-time arrival are perfectly aligned. Incentives are important, but so also are information, communication, and alignment.

1.4. Uncertainty and Multi-Period Optimization

Many of the principal-agent models developed by economists and finance scholars are single-period in which the firm's output gets revealed at the end of the period and no further managerial (agent) actions are required. In these cases, contracting on output, such as measured financial performance, can be optimal. Or, if financial performance, measured by end-of-period stock price or economic value added, is a complete and sufficient statistic for the value managers have created during the period, then incentive contracts based on stock prices or economic value added can also be optimal. But many of the actions that managers take during a period – such as upgrading the skills and motivation of employees, advancing products through the research and development pipeline, improving the quality of processes, and enhancing trusted relationships with customers and suppliers – are not revealed to public investors so that their implications for firm value cannot be incorporated into end-of-period stock prices. Also, while managers may know the amount they spent on enhancing their intangible assets, they may have little idea, in the short-run, about how much value they have created. And, for sure, such value increases (or decreases if the expenditures do not generate future value in excess of the amount spent) do not get incorporated into the end-of-period stock price or residual value (economic value added) metric.

Dynamic programming teaches us that the optimal actions in the first period of a multi-period model are far from the optimal actions in the final period. Managers attempting to maximize total shareholder value over, say, a ten year period cannot accomplish this goal by optimizing reported financial performance or stock price, period-by-period. The Balanced Scorecard recognizes the limitation of managing to financial targets alone in short-time horizons

when managers are following a long-term strategy of enhancing the capabilities of their customer and supplier relationships, operating and innovation processes, human resources, information resources, and organizational climate and culture. But because the links from process improvements and investments in intangible assets to customer and financial outcomes are uncertain (recall the financial problems of several of the early excellent-quality companies), the Balanced Scorecard includes the outcome metrics as well to signal when the long-term strategy appears to be delivering the expected and desired results.

1.5. Stakeholder Theory

Stakeholder theory offers another multi-dimensional approach for enterprise performance measurement. Stakeholders are defined as the groups or individuals, inside or outside the enterprise, that have a stake or can influence the organization's performance. The theory generally identifies five stakeholder groups for a company: three of them, shareholders, customers, and communities, define the external expectations of a company's performance; the other two, suppliers and employees, participate with the company to plan, design, implement and deliver the company's products and services to its customers (Atkinson et al., 1997, p. 27). Management control scholars who apply stakeholder theory to performance measurement, believe "performance measurement design starts with stakeholders" (Neely and Adams, 2002). The stakeholder approach to performance measurement starts by defining objectives for what each stakeholder group expects from the corporation and how each group contributes to the success of the corporation. Once stakeholder expectations or, even further, implicit and explicit contracts between the stakeholders and the corporation get defined, the corporation then defines a strategy to meet these expectations and fulfill the contracts. Thus, while the Balanced Scorecard approach starts with strategy and then identifies the inter-relationships and objectives for various stakeholders, the stakeholder approach starts with stakeholder objectives and, in a second step, defines a strategy to meet shareholder expectations.

Just as Chandler articulated that strategy precedes structure, I strongly believe that strategy also precedes stakeholders. The stakeholder movement likely developed to counter the narrow shareholder value maximization view articulated by Milton Friedman and, subsequently, financial economists, such as Jensen. In this spirit, I believe the stakeholder helped us appreciate the value from nurturing multiple relationships that drive long-term and sustainable value creation. But stakeholder theory confuses means and ends, and therefore ends up less powerful, less actionable, and, ultimately, less satisfying (at least to me) than the strategy map/Balanced Scorecard approach. We advocate selecting a strategy first, and only subsequently working out

the relationship with stakeholders, as needed by the strategy. I will illustrate my point of view with two examples.

First, let's take the example of Mobil's US Marketing and Refining, a well-documented Balanced Scorecard implementation.[7] Mobil learned, through marketing research, that its customers were heterogeneous. Some valued low price only; for them Mobil should offer the cheapest prices, matching or beating the prices of discount stations and the other major gasoline companies. Other customers, however, were not so price sensitive and were willing to pay a price premium, say up to $0.10-0.12 per gallon, if they could have a superior buying experience (quick serve, pay by credit cards at the pump, clean rest rooms, friendly helpful employees, great convenience store, etc.). Stakeholder theory fails here. Which customers' expectations should Mobil satisfy? It could not be the best for both customer groups. Having larger gasoline stations, with more pumps, equipped with self-pay mechanisms, better-paid and more trained and experienced employees, and a full service convenience store costs money, and these costs would need to be covered by higher prices, thereby disappointing the price-sensitive customers. If Mobil offered the lowest prices, it could not afford to invest in the employees, the convenience store, and the larger stations with more self-service and self-pay pumps, thereby disappointing the customers desiring a great buying experience.

Strategy is about choice. Companies cannot meet the expectations of all their possible customers. Wal-Mart meets the apparel needs of one market segment of customers (price-sensitive), Nordstrom meets the needs of another segment (customer relationships and solutions), and Armani and Ferragamo meet the expectations of a third segment (product-leading fashion, fabric, and fit; price-insensitive). Similarly, customers of Southwest Airlines have different expectations of performance than the business and first class customers who fly British Airways. Strategy determines which customers the company has decided to serve and the value proposition that it will offer to win the loyalty of those customer segments. The determination of strategy must come before defining measures of customer satisfaction and loyalty. Otherwise, following the recommendations of the stakeholder theorists, the company would attempt to meet the expectations of all the existing and potential customers it could serve, getting stuck "in the middle," as described by Michael Porter, with both a high cost and a non-differentiated approach, a recipe for strategy failure.

A similar situation occurs for employees. The Balanced Scorecard deliberately did not label its fourth perspective the "employees" or "people" perspective, choosing a more generic

[7] "Mobil US Marketing and Refining (A)," Harvard Business School Case # 197-025.

name, “learning and growth,” to signal that we were not taking a pure stakeholder approach. Under the BSC approach, employee objectives always appear (in the learning and growth perspective) but they get there because they are necessary for the *strategy*, not because someone has labeled them as a “stakeholder.” Consider a pharmaceutical company in the early 1990s. One of its most important groups of employees (what we would subsequently call a strategic job family) is the chemists performing research to screen and identify new compounds to treat specific diseases. The stakeholder approach would interview these key employees to learn their career expectations and develop a strategy that would meet their expectations and strive to continually motivate and satisfy these employees.

During the 1990s, however, and continuing into this century, the key scientific discipline for new drug development shifted from chemistry to biology. The new key employees became molecular biologists and geneticists. Pharmaceutical companies shifted their strategies to adapt to the new technologies; the fate of their previous key stakeholder, Ph.D. chemists, became more tenuous, especially if they did not acquire dramatic new capabilities and competencies so that they could contribute to new drug development. Again, the stakeholder view would lock the company into maintaining relationships with its soon-to-be-obsolete employee group and not moving swiftly enough to reflect that it needed entirely new employees to help it implement the new strategy.

Stakeholder theorists also criticize the Balanced Scorecard for not having a separate perspective for suppliers, one of their five essential stakeholder groups. But as with employees, suppliers get on the scorecard (typically in the Process perspective) when they are essential to the strategy. So companies, such as Wal-Mart, Nike and Toyota, for whom suppliers provide a critical component in creating sustainable competitive advantage, would certainly feature supplier performance in their strategy maps. But, consider a company like Mobil US Marketing and Refining, whose main suppliers are petroleum exploration and production companies, providing a commodity, such as crude oil, and construction companies, who build refineries and pipelines. These suppliers provide essential products and services but don’t provide any differentiation or support of Mobil’s strategy. Similarly, a community bank following a customer intimacy strategy gets its raw material, money, from the US Federal Reserve system. Suppliers are not a critical component of its strategy. So Mobil USM&R and the community bank may not feature suppliers on their scorecards because they don’t contribute to the differentiation and sustainability of their strategies. Again, strategy precedes stakeholders and, in this case, may reveal that one of the stakeholder categories is not decisive for the strategy.

Finally, the Balanced Scorecard does include performance in communities as process perspective objectives when such performance does contribute to the differentiation in the strategy (Kaplan and Norton, 2003). This view matches that articulated by Michael Porter when he advocates that environmental and social performance be aligned to and support the company strategy (Porter and Kramer, 1999, 2006). Occasionally companies do not want shareholder value to be the unifying paradigm for its strategy. That's ok; it's their choice. They don't have to abandon the Balanced Scorecard methodology and switch to the stakeholder view. They can use a strategy map and Balanced Scorecard to articulate their strategy that attempts to simultaneously create economic, environmental and social value, and to balance and manage the tensions among them. This is exactly the path taken by Amanco, a Latin American producer of water treatment solutions, whose founding shareholder believed deeply in triple-bottom line performance.[8]

In summary, stakeholder theory was useful to articulate a broader company mission beyond a narrow, short-term shareholder value-maximizing model. It increased companies' sensitivity about how failure to incorporate stakeholder preferences and expectations can undermine an excessive focus on short-term financial results. The Balanced Scorecard, however, incorporates stakeholder interests endogenously, within a coherent strategy and value-creation framework, when outstanding performance with those stakeholders is critical for the success of the strategy. The converse is not true for stakeholder theory. It does not enable companies to develop a strategy when some of the existing "stakeholders" are no longer essential or even desirable in light of changes in the external environment and internal capabilities.

1.5. Integration and Summary

Dave Norton and I introduced the Balanced Scorecard to provide a missing component and bridge among these various apparently conflicting literatures that had been developed in complete isolation from each other: the literature on quality and lean management, which emphasized employees' continuous improvement activities to reduce waste and increase company responsiveness; the literature on financial economics, which placed heightened emphasis on financial performance measures; and the stakeholder theory where the firm was an intermediary attempting to forge contracts that satisfied all its different constituents. We attempted to retain the valuable insights from each. Employee and process performance are critical for current and future success. Financial metrics, ultimately, will increase if companies' performance improves. And to optimize long-term shareholder value, the firm had to internalize the preferences and expectations of its shareholders, customers, suppliers, employees, and communities. The key was to have a

[8] "Amanco: Developing the Sustainability Scorecard," HBS Case # 107-038.

more robust measurement and management system that included both operational metrics as leading indicators and financial metrics as lagging outcomes, along with several other metrics to measure a company's progress in driving future performance.

This insight became glaringly obvious to us during our initial 1990 multi-company research project when we invited the innovative vice-president of quality and productivity at Analog Devices, Arthur Schneiderman, to address our group. At the end of the presentation, in response to a question about how the company was doing with its quality improvement metric and corporate scorecard, he reported that every quality measure on its corporate scorecard had experienced dramatic improvements. He also noted, however, that the company's stock price had decreased by nearly 70% during the past three years. The company had failed to translate its improved manufacturing and delivery performance into increased sales and margins, and the stock price reflected this shortcoming. The failure to include the link between quality improvements on Analog's quality scorecard to a customer value proposition or to any customer outcomes likely contributed to the shareholder value loss. Norton and I recognized that any comprehensive measurement and management system had to link operational performance improvements to customer and financial performance. Our Balanced Scorecard, while incorporating Analog's operational improvement metrics, also incorporated metrics for innovation, employee capabilities, technology, organizational learning, and customer success. And unlike the stakeholder perspective, we did place shareholder value as the highest-level metric, with all the other stakeholders reflected in how they contributed to the company's success in maximizing long-term shareholder value.

2. Strategic Objectives

As Norton and I began working with the companies, after the initial HBR article appeared, we faced the question about how to choose the metrics that would go on a Balanced Scorecard. We could have adopted the generic metrics that many companies were already using, such as customer satisfaction, customer retention, defect rates, yields, lead and process times, and employee satisfaction. But the client companies and we were dissatisfied with these metrics. They were too generic. By 1992, virtually all companies (airlines and dysfunctional companies, such as WorldCom, being notable exceptions) were attempting to increase customer satisfaction, improve process quality, and motivate employee performance. As we probed this issue with executives, we quickly learned that creating a Balanced Scorecard should not start with selecting metrics.

Many companies, however, already had extensive measurements from their existing quality and performance improvement programs and wanted to create a quick Balanced Scorecard by classifying each of their existing metrics into one of the four BSC perspectives. While having a structure for reporting their nonfinancial metrics was better than having no nonfinancial metrics or simply a long list of them, this bottoms-up process of classifying existing measurements was unlikely to capture the most important drivers of future success.

A second group of companies looked externally for their metrics and conducted benchmarking studies to learn the metrics used by the companies they admired most. Norton and I did not want the Balanced Scorecard to become a benchmarking exercise. We knew that even high-performing companies succeeded with strategies that were quite different from each other. The metrics used by a company following a low cost strategy (WalMart, for example) should be distinct from those used by a company implementing a complete customer solutions strategy (e.g., Nordstrom) or a company with an innovative product leadership strategy (e.g., Armani and Ferragamo). Adopting metrics used by a company with a different strategy would confuse and distract the focus of employees and cause the strategy to fail.

Company executives continually told us that their highest priority was implementing their strategy. We came to recognize that before selecting metrics, companies should describe what they were attempting to achieve with their strategies, and, further, that the four BSC perspectives provides a robust structure for companies to express their strategic objectives. The financial objective would include a high-level objective for sustained shareholder value creation and supporting sub-objectives for revenue growth, productivity, and risk management. The customer perspective would include objectives for desired customer outcomes, such as to acquire, satisfy, and retain targeted customers, and to build the share of their spending done with the company.

In addition to these somewhat generic lagging measures of customer performance, we recognized that companies needed to express objectives for the value proposition they offered customers. The value proposition, the unique combination of price, quality, availability, ease and speed of purchase, functionality, relationship and service, was the heart of the strategy, what differentiated the company from its competitors or what it intended to do better than they for the targeted customers. Thus companies following a low cost strategy would offer low prices, defect-free products and speedy purchase. Product innovating companies offered products and services whose performance exceeded that of competitors along dimensions that targeted customers valued.

Objectives in the process perspective reflected how the company would create and deliver the differentiated value proposition and meet the financial objectives for productivity improvements. Objectives in the learning and growth perspectives described the goals for employees, information systems, and organizational alignment.

Over the years, we learned new ways to write strategic objectives. Many companies now write their strategic objectives in quotes to reflect the voice of their customers and employees. For example, one medium-sized community bank that was shifting from its traditional product push strategy to one that emphasized developing complete financial solutions for its targeted customers expressed its customer objectives as:

1. "Understand me and give me the right information and advice"
2. "Give me convenient access to the right products"
3. "Appreciate me and get things done easily, quickly, and right"

Each of these customer objectives, once identified, could be easily measured, such as by the following list:

1a. Number of customers profiled
1b. Number of customers with financial plans
2. Number of targeted customer using on-line channel for transactions
3. Customer survey responses on questions related to appreciation and ease of working with the bank.

Similarly, the learning and growth objectives, written in the voice of employees, included:

"We hire, develop, retain, and reward great people"
"We are trained in the skills we need to succeed."
"We understand the strategy and know what we need to do to implement it"
"We have the information and tools we need to do our job."

As with the customer objectives, once the employee objectives had been selected and expressed, it was a simple task to select metrics that measured the performance for each of these strategic objectives. These metrics were more aligned to the strategy than generic metrics of employee morale and satisfaction.

Thus, while our initial article had a subtitle, "Measures that Drive Performance," we soon learned that we had to start not with measures but with descriptions of what the company wanted to accomplish. It turned out that selection of measures was much simpler after company

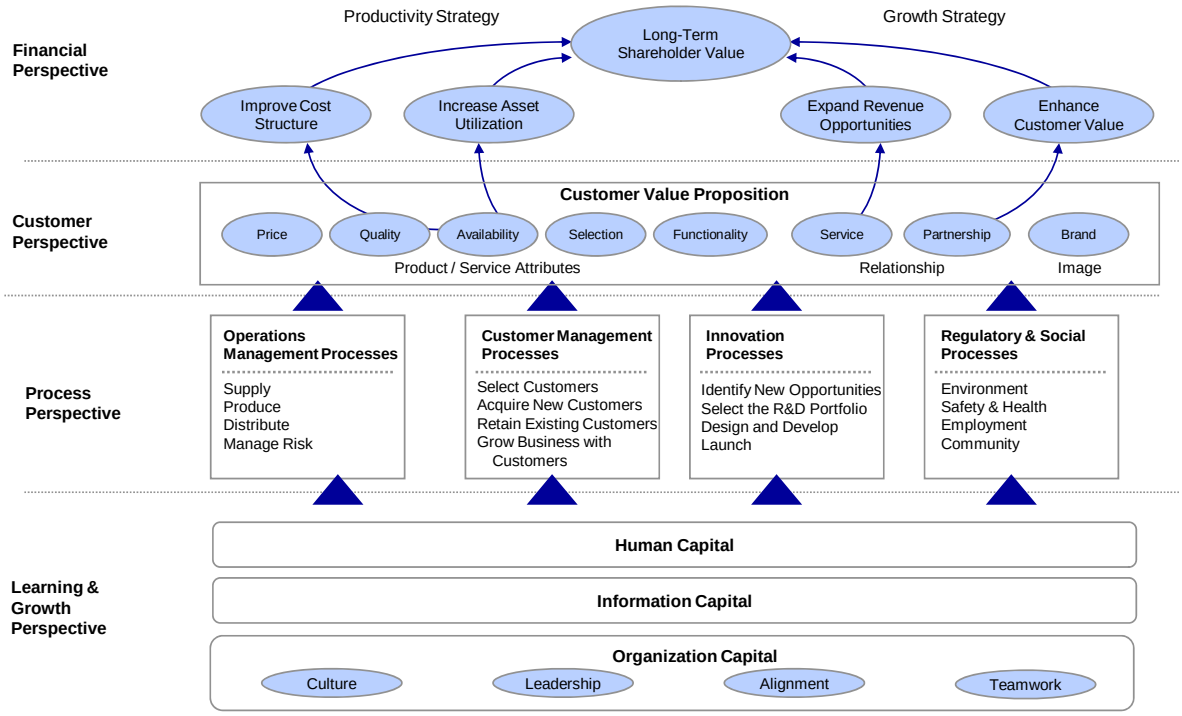
executives described their strategies through the multiple strategic objectives in the four BSC perspectives.

3. Strategy Maps

It soon became natural to describe the causal relationships between strategic objectives. For example, a simple causal chain of strategic objectives would be: employees better trained in quality management tools reduce process cycle times and process defects; the improved processes lead to shorter customer lead times, improved on-time delivery, and fewer defects experienced by customers; the quality improvements experienced by customers lead to higher satisfaction, retention, and spending, which drives, ultimately, higher revenues and margins. All the objectives are linked in cause-and-effect relationships, starting with employees, continuing through processes and customers, and culminating in higher financial performance.

The idea of causal linkages among Balanced Scorecard objectives and measures led to the creation of a strategy map, articulated in an HBR article and several books (Kaplan & Norton 2000, 2001, 2004). **Figure 2** shows the current structure for a strategy map. Today, all BSC projects build a strategy map of strategic objectives first and only afterwards select metrics for each objective.

Figure 2: The strategy map links intangible assets and critical processes to the value proposition and customer and financial outcomes



We recognized that the weakest link in a strategy map and Balanced Scorecard was the learning and growth perspective. For many years, as one executive described it, the learning and growth perspective was "the black hole of the Balanced Scorecard." While companies had some generic measures for employees, such as employee satisfaction and morale, turnover, absenteeism and lateness (probably growing out of the stakeholder movement of the previous decade), none had metrics that linked their employee capabilities to the strategy. A few scholars had investigated the connection between improvements in human resources and improved financial performance (e.g. Huselid, 1995; Becker et al., 1998)

Dave Norton led a research project in 2002 and 2003 with senior HR professionals to explore how to better link the measurement of human resources to strategic objectives. From this work came the concepts of strategic human capital readiness and strategic job families and, by extension, the linkages to information capital and organizational capital. These important extensions to embed the capabilities of a company's most important intangible assets were described in an HBR article and a book (Kaplan & Norton, 2004a&b)

4. Extending Balanced Scorecard to Non-Profit and Public Sector Enterprises

While initially developed for private sector enterprises, the Balanced Scorecard was soon extended to nonprofit and public sector enterprises (NPSEs). Prior to the development of the Balanced Scorecard, the performance reports of NPSEs focused only on financial measures, such as budgets, funds appropriated, donations, expenditures, and operating expense ratios. Clearly, however, the performance of NPSEs cannot be measured by financial indicators. Their success has to be measured by their effectiveness in providing benefits to constituents. The Balanced Scorecard helps NPSEs select a coherent use of nonfinancial measures to assess their performance with constituents.

Since financial success is not their primary objective, NPSEs cannot use the standard architecture of the Balanced Scorecard strategy map where financial objectives are the ultimate, high-level outcomes to be achieved. NPSEs generally place an objective related to their *social impact* and *mission*, such as reducing poverty, pollution, diseases, or school dropout rates, or improving health, biodiversity, education, and economic opportunities. A nonprofit or public sector agency's mission represents the accountability between it and society, as well as the rationale for its existence and ongoing support. The measured improvement in an NPSE's social impact objective may take years to become noticeable, which is why the measures in the other perspectives provide the short- to intermediate-term targets and feedback necessary for year-to-year control and accountability.

One additional modification is required to expand the customer perspective. Donors or taxpayers provide the financial resources—they pay for the service—while another group, the citizens and beneficiaries, receive the service. Both constituents and resource suppliers should be the placed at the top of an NPSE strategy map.

5. The Strategy Management System

My HBS colleague, Robert Simons, developed the Levers of Control management control framework (Simons, 1995a&b) at the same time that Norton and I were developing the Balanced Scorecard. Simons identified several types of management control systems that managers use to motivate, monitor, and manage their strategies. The control systems included belief systems (mission, vision and values), boundary systems, internal control systems, diagnostic systems, and interactive systems. As described at the beginning of this chapter, Norton and I originally envisioned the Balanced Scorecard as an enhanced performance measurement system, labeled by Simons as a diagnostic system. Our vision for the BSC was for managers to

define and track performance among multiple financial and nonfinancial measures that were considered important for company success.

Several senior executives soon taught us that the Balanced Scorecard could operate in a far more powerful manner than its use as a management reporting and performance monitoring system. For example, Larry Brady, then President of the FMC Corporation, stated:[9]

> I think that it's important for companies not to approach the scorecard as the latest fad. […] You hear about a good idea, several people on corporate staff work on it, probably with some expensive outside consultants, and you put in a system that's a bit different [incremental] from what existed before.
>
> It gets worse if you think of the scorecard as a new measurement system that eventually requires hundreds and thousands of measurements and a big, expensive executive information system. These companies lose sight of the essence of the scorecard: its focus, its simplicity, and its vision. The real benefit comes from making the scorecard the cornerstone of the way you run the business. It should be the core of the management system, not the measurement system. [It should become] the lever to streamline and focus strategy that can lead to breakthrough performance.

Brady and other early BSC implementation leaders (at Mobil US Marketing and Refining, Cigna Property and Casualty, and Chemical Retail Bank) adopted and used the scorecard to help them describe their strategies and implement a new strategy management system based on scorecard measurements. The new insights helped us formulate the fundamental structure for a generic strategy management system (Kaplan & Norton, 1996a & b)

The development of the strategy management system transformed the Balanced Scorecard from being an extended diagnostic system to an interactive system, defined by Bob Simons to have the following characteristics (Simons 1995a: 97):

1. Information generated by the system is an important and recurring agenda addressed by the highest levels of management
2. The interactive control system demands frequent and regular attention from operating managers at all levels of the organization.
3. Data generated by the system are interpreted and discussed in face-to-face meetings of superiors, subordinates, and peers.
4. The system is a catalyst for the continual challenge and debated of underlying data, assumptions, and actions plans.

[9] Interview with Larry Brady in R. S. Kaplan and D.P. Norton, "Putting the Balanced Scorecard to Work," *Harvard Business Review* (September-October 1993): 147.

Simons' research indicated that CEOs selected an existing management system, such as the budget, the project management system, or the revenue system, and operated it interactively. Our development of the strategy map and Balanced Scorecard turned out, serendipitously, to offer managers the framework for a generic interactive system. Managers could now design a customized interactive system based on their strategy, and, following Brady's insight, use the strategy map and scorecard as the cornerstone of their management system for executing the strategy.[10]

For example of the system's interactivity, two senior executives at Mobil USM&R described how they used the Balanced Scorecard with their business unit and support unit managers. Bob McCool, CEO of the division stated:

> For a meeting with a BU manager, I have the manager plus representatives from various [support units], like supply, marketing, and convenience-stores. And we have a conversation. In the past we were a bunch of controllers sitting around talking about variances. Now we discuss what's gone right, what's gone wrong. What should we keep doing, what should we stop doing? What resources do we need to get back on track, not explaining a negative variance due to some volume mix.
>
> The process enables me to see how the NBU managers think, plan, and execute. I can see the gaps, and by understanding the manager's culture and mentality, I can develop customized programs to make him or her a better manager.

Brian Baker, executive vice president of Mobil USM&R talked about his meetings:

> I went into these reviews thinking they would be long and arduous. I was pleasantly surprised how simple they were. Managers came in prepared. They were paying attention to their scorecards and using them in a very productive way—to drive their organization hard to achieve the targets. How they weighted their measures spoke clearly about their priorities of relative importance up and down the four perspectives.
>
> Basically, there's no way I can understand and supervise all the activities that report to me. I need a device like the scorecard where the business unit managers are measuring their own performance. My job is to keep adjusting the light I shine on their strategy and implementation, to monitor and guide their journeys, and see whether there are any potential storms on the horizon that we should address.

These managers had never seen Simons' description and definition of an interactive system. But their natural leadership style was to operate their scorecard system to question, probe,

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[10] Many academics, consultants, and managers, however, continue to think erroneously of the scorecard as a performance measurement system only. Their knowledge and acquaintance with the scorecard is probably based only on reading the original 1992 HBR article or the first half of the initial Balanced Scorecard book.

challenge, and coach about the strategy and its implementation, an ideal example of Simons' description of an interactive system.

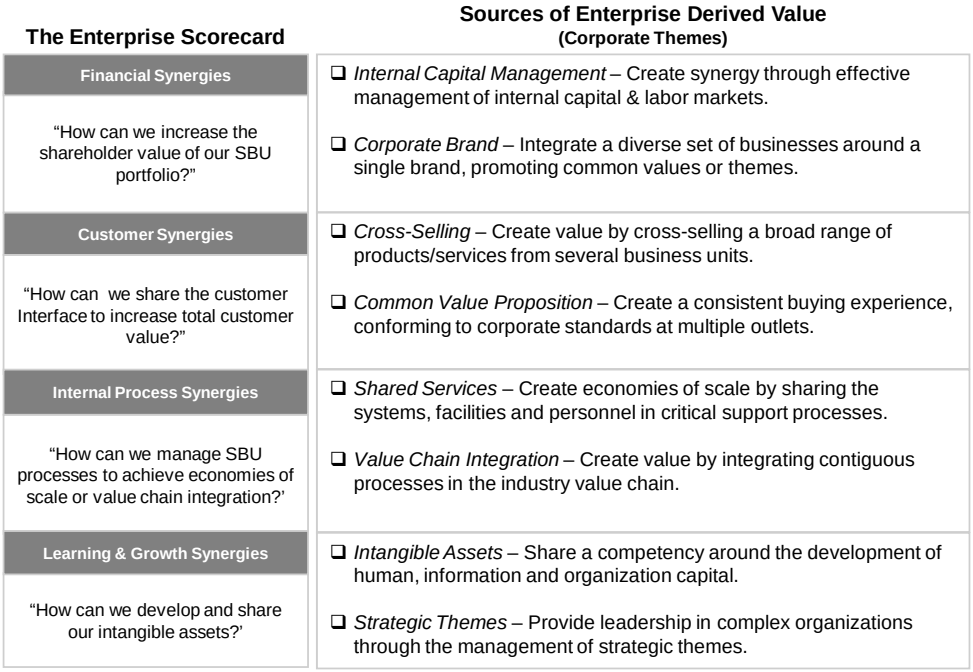
After studying the successful implementations of Mobil USM&R and other early adopters we proposed the following five leadership and management processes for successful strategy execution, helping to create "the strategy-focused organization" (SFO) (Kaplan & Norton 2001):

1. Mobilize change through executive leadership
2. Translate the strategy
3. Align the organization to the strategy
4. Motivate employees to make strategy their everyday job
5. Govern to make strategy a continual process

This research completed the transformation of the Balanced Scorecard from a performance measurement system to an interactive management system for strategy execution.

Subsequent work, documented in additional books and *Harvard Business Review* articles, expanded upon this framework. Our third book, *Strategy Maps*, already mentioned, expanded upon Principle 2. Our fourth book, *Alignment*, expanded on Principle 3. We showed how strategy maps and scorecards could articulate the role for a corporate strategy that defined how to a collection of business units could create more value than if each unit operated autonomously, as a stand-alone company (Kaplan & Norton, 2006a&b). We discovered that all the various corporate strategies for enhancing the value of their business units could be represented using the four Balanced Scorecard perspectives, as shown in **Figure 3**.

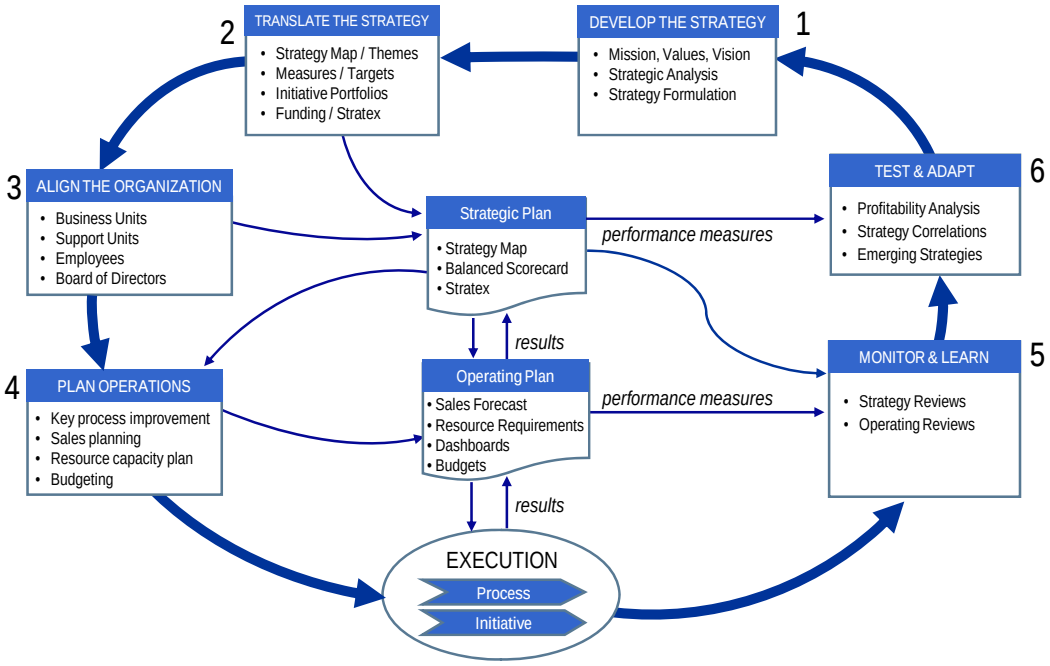
Figure 3 Sources of Enterprise Synergy



Our most recent work has focused on Principle 5, in which companies link strategy and operations (Kaplan & Norton, 2008a&b). **Figure 4** shows the architecture of a comprehensive six stage closed-loop management system that links strategic planning with operational execution.

1. Develop the strategy
2. Translate the strategy
3. Align the organization
4. Plan operations
5. Monitor and learn
6. Test and adapt the strategy

Figure 4 A Closed Loop Management System for Strategy Execution



In the sixth stage, managers use internal operational data and new external environmental and competitive data to test and update the strategy, which launches another loop around the integrated strategy and operational management system. This work integrates not only our prior work on strategy maps, alignment, and employee motivation, but also quality management, dashboards, time-driven activity-based costing for resource capacity planning and strategy feedback (Kaplan & Anderson, 2004, 2007), strategy development and formulation tools, and analytics for testing and adapting the strategy.

This most recent development is about much more than just the Balanced Scorecard. It embeds the original Balanced Scorecard framework as a component within a comprehensive management system that integrates strategy and operations. One can view the proposed management system as accomplishing the comprehensive framework advocated earlier by Herb Simon – for scorecarding, attention-directing, and problem-solving – and Robert Anthony, for strategic planning, management control and operational control. Rather than have them as separate activities, as suggested by Simon and Anthony, we now have the various activities for

strategy development, planning, alignment, operational planning, operational control, and strategy control integrated within a closed-loop, comprehensive management system.

The integrated and comprehensive closed-loop management system has many moving parts and inter-relationships, and requires simultaneous coordination among all organizational line and staff units. Existing processes that today are run by different parts of the organization – such as budgeting by finance, personal goals and communications by human resources, and process management by operations – must be modified and coordinated to create strategic alignment. They must work as a system instead of a set of uncoordinated sub-systems as they do today. In addition, we have proposed some entirely new processes – such as creating strategy maps and scorecards that align organizational units and employees to the strategy. Because these processes are new to most organizations, they have no natural home within the existing structure. Clearly, organizations face a complex task to implement such a complex, inter-related system.

We have identified the need for a new organizational function, which we call the Office of Strategy Management (OSM), to be the process owner of the strategy execution system and its component processes (Kaplan & Norton 2005). The OSM has ownership for the new processes that translate and cascade the strategy, link it to operations, and organize the strategy review and strategy testing and adapting meetings. It also integrates and coordinates activities that align strategy and operations across functions and business units. The OSM, analogous to a military general's chief-of-staff keeps all the diverse organizational players ─ executive team, business units, regional units, support units (finance, human resources, information technology), departments, and, ultimately, the employees ─ aligned with each other, operating independently, when appropriate, but also coming together, as needed, to execute the enterprise's strategy.

6. Future Opportunities

This article has documented the precursors of the Balanced Scorecard and its continued evolution, from its introduction in 1992 to recent developments in 2008, the time at which this article was written. Intensive and continual collaboration with innovating companies, public sector agencies, and nonprofit organizations have informed the enhancements and capabilities of the original Balanced Scorecard. Among these advances are the following:

- Strategy maps of strategic objectives
- Extending the concept to nonprofit and public sector enterprises

- Measurement of strategic readiness of intangible assets
- Role for executive leadership
- Creating synergies through alignment of business and support units to corporate strategy
- Using communication to create intrinsic motivation
- Deploying extrinsic motivation by aligning employees' personal objectives and compensation to strategic objectives
- Linking strategy and operations in a new closed-loop management system
- Creating the office of strategy management

It's not easy to respond when questioned about what happens next. While each of these advances was a logical extension of previous work, each presented itself incrementally and opportunistically, not as part of a planned evolution of the concept over a 15 year period. While acknowledging a cloudy crystal ball, I can see several big opportunities for future work.

First, the early adopters of the BSC – Rockwater, FMC, Mobil, Chemical Bank, Cigna P&C, AT&T Canada, Wells Fargo Online Services, and City of Charlotte – had superb leaders. Initially, perhaps, we took such leadership for granted. Subsequent experience revealed that when the Balanced Scorecard failed in organizations, we could usually trace the roots of failure back to lack of executive leadership, not to any particular inherent design flaw in strategy maps, scorecards, or the four other strategy-focused organization principles. The failures occurred when staff groups or functional officers introduced the scorecard with the acquiescence but not the leadership and commitment of the CEO of the business unit. And the purpose for introducing the Balanced Scorecard was not for effective strategy execution, but for more tactical reasons, such as to change the compensation system, to reinforce a quality management system, or to change the reporting system to give managers more access to information about their operations. All of these goals are laudable but none, by itself, can transform and align an organization for effective strategy execution, the principal deliverable, as it turned out, for Balanced Scorecard implementations.

Future research studies of BSC implementations could certainly benefit from measuring organizational leadership in each implementation and assessing this factor's role in creating success. Several authors have done limited testing about the environments in which the Balanced Scorecard has succeeded or failed. Most of these studies were ad hoc correlations of nonfinancial and financial variables. Few of the studies were informed by the concepts described in our writings on strategy-focused organization principles and the most recent work on integration of

strategic planning and operational execution. The empirical evidence that Norton and I have seen and documented over the past 15 years identifies *leadership* as the most important variable explaining success or failure. To state a bold hypothesis, leadership may be both necessary and sufficient for success. It is necessary since without it, the Balanced Scorecard will be just another ad hoc reporting system, and the gains from embedding the Balanced Scorecard in a system for effective strategy execution will not be realized. Leadership is required to translate strategy into the linked strategic objectives on a strategy map and then to use the map and the accompanying scorecard *interactively* as described in this chapter. The more challenging claim is that it is also sufficient. This hypothesis emerges from the documented best practices, drawn from hundreds of successful implementations, on how to build and operate the new management system for strategy execution. Managers can apply this body of knowledge, which is referenced in this article, to implement the four strategy-focused organization principles other than leadership. But none of the four principles can be effectively mobilized and sustained without leadership at the top. Of course, such a strong claim about both necessity and sufficiency needs to be tested through careful research designs and instruments.

Research in leadership would start with measurement; there could be multiple forms of effective leadership, but some aspects may be necessary or common across all leadership styles. Once leadership can be measured validly, then cross-sectional or longitudinal research can be performed to see its influence on explaining variation in the results delivered from following the five SFO principles.

Second, the emerging literature and practice on enterprise risk management needs to be more formally embedded in the strategy map and Balanced Scorecard. Many companies, especially financial services companies, have already specified risk management objectives in the scorecard's financial and process objectives. But these additions have been incremental and not part of an integrated risk management framework. Our generic strategy map template (see Figure 2) emphasizes two primary financial sub-strategies, revenue growth and productivity, as the drivers of sustainable shareholder value creation. Surely, risk management must be introduced as a third pillar for financial performance, and perhaps an entirely new set of risk management processes should be included within the process perspective. Given the intense focus of companies around the world to improve their measurement and management of risk, we should expect important advances, over the next five years, to embed risk management objectives more centrally into the strategy execution framework.

Third, strategy maps still represent a highly-aggregated view of causal relationships among strategic objectives. In order to make strategy maps more visually appealing to managers and employees, we have simplified the causal relationships assumed within the strategy map (one might even describe the generic strategy map as a "dumbed-down" representation of causal linkages). Norton and I, both trained as electrical engineers, have been aware from the outset that systems dynamics techniques could help produce a more detailed model that links both strategic and operational objectives in a more elaborate mapping exercise. A detailed systems dynamics model would incorporate causal linkages that have estimates of magnitude and time delay, as well as more complex feedback loops than are presently visualized in the generic strategy map. For an example of such a quantified linkage, analysts could estimate the percentage improvement in a lagging indicator that would be expected from, say, a 1% improvement in a leading indicator. The analysts would also estimate the time delay between a 1% improvement in a leading indicator and the expected response in a lagging indicator. And the causal linkages need not be uni-dimensional. The model could include multiple leading indicators and impacts that can be a combination of linear, multiplicative, or even Boolean (no impact if the improvement is less than a given amount; a jump in impact once a threshold level of improvement has been achieved).

The statistical and modeling capabilities for constructing models of detailed causal relationships already exists. And many companies, particularly those operating hundreds or thousands of relatively similar decentralized units, generate sufficient data each month to estimate even complex models. The shortage seems to be how to marry analytic capabilities with companies that generate sufficient data and have a senior management team capable of understanding and using the dynamic, causal models effectively to guide their strategies and operations.

Thus, while much has been learned over the past 15 years, much interesting research can still be done. And with many private, public sector, and nonprofit enterprises around the world implementing new strategy execution systems based on the Balanced Scorecard framework, the opportunities for informed empirical research are great.

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