Moving Strategy Forward: Merging the Balanced Scorecard and Business Intelligence

Even companies that embrace the Balanced Scorecard often take a backward approach to monitoring performance. Many organizations choose metrics based on how much effort data collection requires, an approach that prevents the company from taking maximum advantage of its information assets.

by Bob Paladino & Nancy Williams

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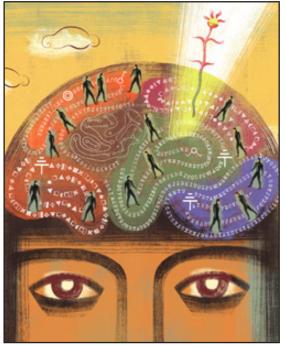
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WHAT INFORMATION does your corporate leadership team rely upon to conduct its meetings? Do you use leading indicators that reveal progress toward achieving strategic goals — or do you rely on legacy systems containing lagging indicators such as financial results? Are management or operating review meetings dominated by discussions about who has the most current data and which report is most accurate?

Companies become handicapped by limited, low-quality data views when they allow the information that is already available, and is easiest to gather, determine how they manage the business. It makes sense that an organization should first make decisions about its strategies and information requirements, then subsequently align information assets to support strategy management. But many companies continue to operate in reverse.

When approached as a means to support corporate strategy, business intelligence (BI) solutions can enhance performance management programs' ability to optimize value to the organization. A business that is pursuing Balanced Scorecard strategic alignment can use BI solutions for trend analysis, predictive analytics, customer data integration, scorecards and dashboards, and data mining. We have found through our separate research initiatives that the most successful organizations leverage proven performance management methodologies such as strategy maps and the Balanced Scorecard, then choose metrics based on the strategic objectives set through those methodologies, and finally deploy business intelligence solutions to gather the data necessary for performance optimization.

Step 1: Developing a Top-Level Strategy Map

While leading a consulting practice for Robert Kaplan and David Norton, Bob realized that the first step in preparing to develop a strategy map or a balanced scorecard is to understand the basic terminology. We don't have space here to impart in-depth skills training, but at least we can define the strategy map and balanced scorecard upon which BI infrastructure should be based.

The vertical view. Exhibit 1, on page 14, displays a portion of a corporate (level-one) strategy map focused on the strategic theme "product development." It contains the four perspectives of the Balanced Scorecard. The strategy map should be read from bottom to top, as movement upward indicates causation from the learning and growth perspective, to the internal process perspective, to the customer perspective, and finally to the financial perspective. The strategy map can be thought of as a company's road map to strategic goals, whereas the organization's balanced scorecards, which report on metrics related to the strategic goals, show the company's progress along the path the road map outlines.

The strategy map is designed and developed for each level in the organization with input from the respective leadership teams. Depending upon the business model, lower levels may adopt the corporate map in what is called a "replica" cascade model, in other cases the corporate map is broken down, distributed and expanded at successive lower levels in what is referred to as a "contributory" cascade model. The strategy map is designed, tested, and refined until it tells the story of the organization's fundamental strategy. For the company in exhibit 1, the management team believes that its objectives have the following causal relationships: Objective L1 — Employ stable, high-talent workforce, enables the company to attain its internal process objective, P1 — Execute world-class internal product development. Then achieving P1 enables the customer objective C1 — Provide innovative products, which (in turn) logically supports F1 — Grow new product revenue.

Exhibit 1 provides insight into one of the sample company's strategic themes: product development. In doing so, it shows us a vertical slice of the overall corporate strategy map. A company's strategy map usually consists of three or four such themes, containing a total of between 20 and 25 strategic objectives.

The horizontal view. Reading exhibit 1 from left to right reveals a description of each objective, the objective's key measures, and targets for those metrics. For example, the description of objective P1 — Execute world-class internal product development, is "accelerate new product development to bring new functionality to market before the competition." Including a brief definition provides more insight into the strategic intent of the development of the objective.

As the corporate leadership team works with managers companywide to design the strategy map, they simultaneously identify one or two Balanced Scorecard measures that can show how effectively the company is executing each strategy map objective. For objective P1 in exhibit 1, the company came up with two measures: P1.1 — Product functionality, which rates the innovativeness of new products, and P1.2 — Time to market, which captures the company's ability to rapidly bring new products to market (in turn enabling premium pricing and a longer revenue cycle per product).

The targets for the strategy map's measures communicate performance expectations and enable color-coding of actual results against these targets on a balanced scorecard. The leadership team considers a number of factors in setting corporate, level-one Balanced Scorecard targets — factors such as competitors' performance, the company's experience and track record, market demand, and opportunity costs.

Back to the example in exhibit 1, the goal for P1.1 — Product functionality — is to be rated first or second in the market in terms of innovation in product functionality, a key differentiator in satisfying customer demand. In contrast, one of this company's competitors might consider a rating of third or fourth in the industry in terms of product innovation appropriate because its strategy is to imitate the leader. Yet another competitor's strategy might be to be the low-cost provider in the industry, so innovation ratings might not even make it onto that business' strategy map. Similarly, for the business in exhibit 1, the target for P1.2 — Time to market — is nine months from concept design to product commercialization and availability to customers. In contrast, one of this company's competitors, which is a "fast follower" rather than an innovator, might have an intentionally longer time-to-market target of 12 to 15 months. Clearly, targets that tie in with corporate strategy are essential in setting the bar for employee expectations and in managing performance.

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Step 2: Creating Balanced Scorecards for All Levels

Because the last perspective in the strategy map's chain of causation is the financial, management teams may be tempted to track corporate performance using traditional management reports that focus on financial outcomes such as F1 — Grow new product revenue. However, the real power of the information sets within the Balanced Scorecard methodology lies in leading, nonfinancial indicators. These metrics can offer predictive capabilities into future performance, and this is where the Balanced Scorecard provides a competitive advantage. This is particularly true as corporate, level-one measures cascade down to levels two, three, four, and beyond, since the metrics become more operational in nature. While all four perspectives of the Balanced Scorecard remain important as strategy maps move down through the company, the mix of measures in product development (for example) typically becomes more concentrated in the process perspective, since the ability to execute on process goals becomes the key competitive differentiator and creator of value.

Exhibit 2, on page 15, provides insight into the candidates that managers of our example company might consider in choosing metrics for levels two and three within the level-one P1.2 — Time to market measure. As you can see, the corporate-level P1.2 consists of many component, contributory measures, which can help executives understand it at lower, operational levels. How do companies choose metrics for lower-level scorecards? As we mentioned earlier, many today simply choose those for which information is easiest to obtain. The measures that populate an effective scorecard will require a BI solution for collection, collation, and queries. However, companies that want to tie strategy to action carefully review their choices of metrics, using a scoring mechanism to arrive at the final set, and determine their BI needs only after arriving at a list of metrics that reflect corporate strategy.

Metric selection is a vast topic, but when managers approach the effort with deliberateness and reasoning, they set their company on the right path. First, note that the primary measures executives should consider at each level are those which tie directly to the higher-level measures under which they're subordinate; but they will also select "local" operating measures. For example, since exhibit 1's level-one measure P1.2 — Time to market — is concerned with speed to market, the candidate

Exhibit 1

The Strategy Map, Balanced Scorecard, and BI Describe and Enable Strategy Execution — Leading Indicators Provide Predictive Value

	STRATEGY MAP (OBJECTIVES)	OBJECTIVE DESCRIPTION	MEASURE	TARGET	LEADING/ LAGGING)
FINANCIAL	F1-Grow new product revenue	Grow revenue from new products as an indication of the health of our revenue mix	• Annual revenue growth • Percent revenues from new products	+25% 30%	• Lagging • Lagging
CUSTOMER	C1-Provide innovative products	Satisfy customer needs for state-of-art capabilities to improve customer retention and increase market share	• Customer retention • Share of account	80% 40%	• Lagging • Lagging
INTERNAL PROCESS	P1-Execute world-class internal product development	Accelerate new product development to bring new functionality to market before the competition	• (P1.1) Product functionality • (P1.2) Time to market	#1 or #2 in product rankings 9 months	• Leading • Leading
LEARNING & GROWTH	L1-Employ stable, high-talent workforce	Acquire, develop, and retain strategic skills that enable strategic objectives	• Specialized skills availability • Succession planning for high potential employees	90% 95%	• Leading • Leading

STRATEGIC THEME: PRODUCT DEVELOPMENT

FOUR PERSPECTIVES

subordinate measures in exhibit 2 do not include productivity gauges such as hours per project, even though hours per project might affect the corporate objective, P1 — Execute world-class internal product development. Instead, all relate to speed to market, and their quality as level-two and –three metrics is affected by the closeness of their relation to metric P1.2.

The first category of metrics in exhibit 2 — product development success rates — is concerned with measuring the effectiveness, or win rate, of the development process. These measures focus on employees achieving design goals, but they lack the sense of urgency for these goals' accomplishment that is inherent in the P1.2 — Time to market metric. Employee design teams could attain 100 percent success but take three years to bring a new product to market, thus missing the strategic intent of the higher-level measure. Therefore, category one in exhibit 2 receives low marks for inclusion in lower-level scorecards as part of the P1.2 metric family.

Exhibit 2

Candidate "Time to Market" Leading Process Measures

1. Product development success rates
- Ratio of products completing phases 1 through 3
- Ratio of products entering/completing phase 1, "design & develop product"
- Ratio of products entering/completing phase 2, "test market product"
- Ratio of products entering phase 3, "full commercialization"

2. Product development cycle times
- Cycle time (days) for products from phase 0, "product concept design," to completion of phase 3, "full commercialization"
- Cycle time (days) for products from phase 0, "product concept design," to completion of phase 1, "design & develop product"
- Cycle time (days) for products from completion of phase 1 to completion of phase 2, "test market product"
- Cycle time (days) for products from completion of phase 2 to completion of phase 3, "full commercialization"

3. Product development success rates on time
- Ratio of products completing phases 1 through 3 on time
- Ratio of products from phase 0, "product concept design," to completion of phase 1, "design & develop product," on time
- Ratio of products from completion of phase 1 to completion of phase 2, "test market product," on time
- Ratio of products going from completion of phase 2 to completion of phase 3, "full commercialization," on time

The second category of measures in exhibit 2 — product development cycle times — is focused on the number of days required to achieve product development milestones. Thus, in spirit, it aligns with the top-level measure. However, this group of measures does not provide visibility into the success of product-development initiatives, so it will not identify products that are off track, and thus may miss a substantial hidden obstacle in the company's quest for speed. This group of measures receives average marks by the leadership team.

The third category of measures — product development success rates on time — tracks both the speed and effectiveness of the product-development process. Essentially, these metrics measure what, at a given speed, is the yield or value of the process. The leadership teams at levels two and three believe this category provides them with two key factors that indicate the company's performance in terms of its product development time to market. These metrics then can be further broken down into constituent components as scorecards move even lower into the company.

Balanced scorecards at levels two, three, and four produce more frequent reports, which contain more detail, than those at level one. A shop floor supervisor may use minute-by-minute run charts to redirect behaviors of her teams. And level three and four balanced scorecards break measures into submeasures, each of which has corresponding targets. Although our example has been focused on speed, companies will often include productivity measures (e.g., hours per product phase, step) in lower, operational-level scorecards to ensure that they do not achieve speed "at any cost." While cost minimization is not the primary strategy, costs are still managed in our case company at the lower levels. Including financial measures in a balanced scorecard's process perspective is a common mistake in scorecard design. Some mixed financial/process metrics that are commonly used to measure product development effectiveness include NPV (net present value), ROI, or time to break even; percentage of sales dollars resulting from products released in the previous three years; the percentage of products sold that were released in the previous three years; the percentage of sales dollars or products sold resulting from new products released in the prior year; and time to profitability for new product/service development projects. The true value

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of the Balanced Scorecard process perspective lies in its ability to provide an early warning system for process problems or opportunities. Financial information, by definition, is lagging; financial results may not show up in a product development cycle until years after the cycle begins. Financial measures may indicate a problem too late for a company to make course changes. But nonfinancial, leading process measures like those in exhibit 2 can provide insight into a product's strategic value months, sometimes even years, before the accountants can sound the alarm bells.

A company choosing metrics should rigorously evaluate the correlations among its selected measures using the logic embedded in the linked strategy map objectives. Over time, these correlations — and the metrics' predictive value — should become clearer. The value of the strategy map/Balanced Scorecard approach is that a company can leverage correlations to proactively understand the likelihood of customer and financial results (lagging indicators) months, even quarters, in the future — or at least to spot trends before the competition sees them. In order to accomplish this, one needs robust BI tools to capture data sets and enable predictive analytics.

Step 3: Supporting Corporate Scorecards Via the Right BI Solution

The definition of the strategy map and the identification of optimal measures, both nonfinancial and financial, are important precursors to designing a performance management software system. However, even companies that make smart metrics decisions tend to underestimate the challenges inherent in defining, accessing, collecting, and integrating the data they need to report on their performance relative to those chosen measures. Doing so manually can be expensive, cumbersome, and lead to problems with data quality. This is where business intelligence comes in; BI solutions are ideal for addressing Balanced Scorecard data challenges.

Once a company has identified leading and lagging measures, it needs to evaluate each measure's relative business value versus cost of implementation. Such an analysis can guide performance measure implementation decisions. For example, the exhibit 2 measure — Ratio of products from completion of phase 1 to completion of phase 2, "test market product," on time — might be considered a critical leading measure since it indicates when products are likely to make it to market and begin generating revenue. In contrast, the measure — Ratio of products going from phase 0, "product concept design," to completion of phase 1, "design & develop product," on time — may be considered a measure that would be nice to have but is of lower business value. Evaluating the business priority of candidate measures based on their criticality in supporting business performance objectives is an important first step in determining what investments to make in implementing performance measures.

When an organization has evaluated the relative business value of its candidate performance measures, it needs to determine how feasible, and how costly, obtaining the necessary data will be. Continuing our example, that company's next step is to determine whether the information needed to calculate each measure under — Ratio of products completing phases 1 to 3 on time — in exhibit 2 is available electronically. If it is, the company must figure out whether the software systems that can supply this data use consistent definitions to flag product status and whether those definitions logically align with the definitions used by the strategy map/Balanced Scorecard initiative.

Suppose that products under development are tracked in one or more databases specific to product development, and that once a product has completed test marketing it leaves the scope of the product development software. Then its performance is tracked only by the line of business responsible for selling it. To follow products from concept to commercialization, and to get accurate data on the company's P1.2 — Time to market metric, the company will have to access numerous software systems. The target for this corporate measure is nine months, but the company will have to determine whether the various systems calculate this information in the same way. Will they base a calculation of time, in months, on work days, or on calendar days? And do they define business events in the same way? It would not be surprising if the underlying systems had different ways of representing products entering and leaving the phases of the life cycle. For example, one system might break our phase 1 — design and develop product — into two subphases, a "design" phase and a "develop" phase, while another system might consider this a single phase in the product development life cycle. To ensure data out of the systems was comparable, we would have to consider the start of the "design" phase in the first system as equivalent to the start of "design and develop" in the second system, and the conclusion of the "develop" phase in the first system to be equivalent to the end of "design and develop" in the second system. The initial and recurring costs of accessing the underlying systems that contain this information, then collecting, processing, and delivering the information, should all be factored into the cost of adding this measure to the company's balanced scorecards.

Clearly, if a company needs to purchase business intelligence software to report on a specific metric, the purchase will add to the cost of making the metric part of the organizational scorecard. But as they work through the measure-selection process, businesses should keep in mind that manual approaches are often untenable in managing the data that populates a balanced scorecard's nonfinancial perspectives. In many cases, implementing a BI solution is more cost-effective than error-prone and labor-intensive manual efforts would be. One client that we are working with has estimated that the cost of manually collecting and integrating data to derive its Balanced Scorecard measures exceeds $2 million per year. This client has also concluded that the quality and reliability of the performance data produced by its manual collection processes are poor.

As they weigh costs and benefits, companies should also be aware that BI software's capabilities extend beyond conventional query and reporting. Business intelligence tools can provide trend analysis, predictive analytics, integrated customer views, scorecards and dashboards, and data mining. In our example, in addition to tracking new products' movement through the development life cycle, managers could use a BI solution for activities like analyzing new-product revenue projections. BI software could tell the company whether the products that make it through to commercialization have high revenue potential based on test-market results. It could project performance for products in the development pipeline based on total expected future demand and on pricing assumptions that factor in expected competition. And it could help managers figure out how to adjust their new-product revenue forecasts based on this analysis.

Contributing to the value of a BI solution, managers in our example could also use a business intelligence solution to analyze new-product target marketing; BI software could help them determine whether the products that the company has successfully test-marketed are attracting the target market that they're trying to reach. They could use the BI solution to plan and analyze new product commercialization, examining where certain products have done well in test-marketing and where they have not done well, then adjusting product rollout distribution plans accordingly. And they could analyze new-product marketing and sales-force targeting, using the BI software to determine how best to target sales and marketing efforts to ensure optimal sales results. After a company selects the metrics it believes will provide the most value in gauging its performance, and as it evaluates the costs of collecting data on those measures, it will usually undertake a 10- to 12-week-long planning project to identify software that could further support its performance management objectives. It will first identify and prioritize the types of BI applications it would like to use to support the Balanced Scorecard metrics it has chosen. Then it will assess whether the information needed to build the desired BI application is currently available, at an acceptable level of quality, in any corporate software systems. Additionally, it will determine how much technical complexity would be involved in building a BI application to pull together all the data necessary for the nonfinancial Balanced Scorecard measures and for the other analyses that the company deems valuable. Through this planning project, the company can determine the tradeoffs between business value, on the one hand, and the combination of technical difficulty and costs associated with each prospective metric and BI-analysis capability, on the other.

Note that some organizations may already have focused BI capabilities within their supply chain management (SCM) or customer relationship management (CRM) software. Although these applications may not provide the full set of desired BI capabilities, or the level of required information integration, they should be leveraged where possible to contribute to the overall BI solution.

A good starting point in evaluating how much your metrics of choice would benefit from a supporting BI effort is to ask the following questions: Are we currently getting the information we need to both measure and manage our achievement of performance management goals? To what degree is our performance management system compromised due to the complexity of data integration and our reliance on manual approaches? Is business performance management information consistent and trusted throughout the organization? Has the cost of data collection become prohibitive? And, most important, will a BI software solution allow us to collect and analyze the data we need to track our performance along the nonfinancial measures we have chosen?

To date, very few organizations have recognized and leveraged the potential that BI offers in supporting the Balanced Scorecard methodology. Those that have, however, are leaders in their industries. These companies recognize the value of strategic alignment as first envisioned by the Balanced Scorecard. They bring this alignment to life by using information to optimal strategic advantage, while their competitors struggle to determine (and then support with the right data) the optimal measures for business performance management. Most organizations have not yet begun to tap into the full potential of information-based competition.

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