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"Balanced Scorecards in the Business-Centric BI Architecture"

Steve Williams

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Steve Williams

Contact Information:
Steve Williams
301-926-2452
steve.williams@decisionpath.com

Introduction

More and more companies are using the Balanced Scorecard as a management tool to improve business results – measured as profits in the private sector and as productivity and service in the public sector. This trend has spawned Balanced Scorecard software, an analytical application that automates collecting and displaying performance measurement information in relation to strategic, tactical, or operational targets within four subject areas: financial performance, performance for customers, internal operating performance, and organizational learning performance. The adoption of Balanced Scorecard software raises the question of how should such software fit within the broader Business-Centric BI Architecture.[1] Organizations who get this wrong will have deployed a stove piped BI application that provides performance measurement information that conflicts with that provided by other analytical applications – such as financial analytics or supply chain analytics. Organizations who get this right will have aligned the deployment of Balanced Scorecard software with a broader Business-Centric BI architecture. With such alignment comes the opportunity to leverage existing data and technology assets and thereby ensure a lower-cost, lower risk path to a successful Balanced Scorecard deployment.

Background

Over the past decade, business performance management (BPM) frameworks such as the Balanced Scorecard have been adopted by a growing number of major organizations.[2] A 1999 Bain & Company survey of adoption of management tools revealed that almost 44% of firms in the survey used the Balanced Scorecard, and that the mean satisfaction rating among users was 3.85, with 5 being the highest rating.[3] While a number of other management tools had higher adoption rates and higher satisfaction rates, the data suggest that BPM frameworks such as the Balanced Scorecard will be a staple within large organizations for the foreseeable future.

The business requirement for BPM frameworks stems from the fundamental limitation of "managing by the numbers." Executives have long known that managing by the numbers, instead of managing the business processes that drive the numbers, ignores the root causes of business performance and often leads to gaming. To overcome this, performance management frameworks have been expanded to incorporate *non finan-*

cial performance measurements. Examples include capacity utilization percentages, customer satisfaction ratings, cycle times, units of output, and cases handled, to name but a few of the thousands of different– and often industry specific– non financial performance measures.

The need for BPM frameworks manifests itself at all levels and across all functions of an organization. Many executives now recognize the need to manage business performance strategically – to understand the key linkages between strategy and the business processes undertaken to execute strategy, and to measure the performance of those business processes. This need for strategic performance management tools has been the impetus for the Balanced Scorecard and other BPM tools. At the same time, functional managers and middle managers need performance management tools appropriate to the business processes they manage, which hopefully are aligned with the business strategy. This need has given rise to different strategies for using Balanced Scorecards. These range from the traditional top-down approach with supporting scorecards "cascaded" down from corporate, to bottom-up approaches where business units devise scorecards that are meaningful for their purposes and there is no aggregated view of the whole company due to local differences in measures.

Recognizing these broad needs for scorecard frameworks and tools, BI software vendors have developed packaged performance management offerings that are certified by the Balanced Scorecard Collaborative to meet Balanced Scorecard functional standards.[4] As of June 2004, there were 19 such vendors, including all of the leading BI and ERP vendors. Balanced Scorecards are essentially analytical applications that map/model, accumulate, display, and report multi-dimensional performance information, including financial and non financial performance targets, actual performance measures, variance and trend analyses, and associated metadata. Given these functions, traditional BI tools are ideally suited to the task of automating the data collection, aggregation, and presentation tasks associated with using the Balanced Scorecard as a performance management framework.

The proliferation of Balanced Scorecard software raises two key questions:

1) How should a Balanced Scorecard application fit with other analytical applications and performance management frameworks in the Business-Centric BI Architecture?

2) How should the performance measurement data required by Balanced Scorecard applications be acquired, staged, and managed and how does that approach fit with the overall BI data architecture?

We believe that the way these issues are addressed has substantial financial and technical implications for organizations that would adopt Balanced Scorecard software to improve business performance. The focus of this article is on sorting these issues out.

The Balanced Scorecard and the Business-Centric BI Architecture

The Balanced Scorecard is generally presented by the Balanced Scorecard Collaborative as a strategic management framework, the use of which provides management the means to measure company performance in key business areas against target performance levels. It should be noted at the outset that the methodology is essentially silent about the data architecture and data management issues involved in deploying a Balanced Scorecard.

To develop a Balanced Scorecard, one typically does a top-down mapping between business drivers, business strategies, and value-driving business processes. One then selects financial and non financial performance measures for those value-driving processes – with the measures drawn from four perspectives: financial performance, performance for the customer, internal operating per-

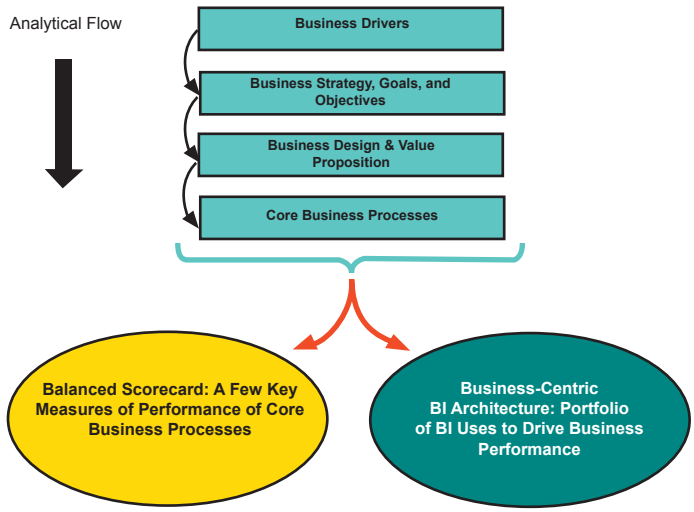
formance, and learning. So, for example, if a business competes on price, its Balanced Scorecard might include the following performance measures:

- Financial perspective: operating margin dollars and percentage.
- Internal perspective: unit cost, capacity utilization.
- Customer perspective: order-to-delivery cycle time, percent perfect orders.
- Learning perspective: number and percentage of certified customer service reps.

These financial and non financial measures may be specific to the Balanced Scorecard initiative. More likely, some or all of these measures may be used within other analytical applications, such as customer analytics, where measures such order-to-delivery cycle time are standard fare. In order to avoid stove piping and achieve the so-called "single view of the truth," we must ensure that the data used by the Balanced Scorecard is consistent with the data used by other analytical applications that use the same measures. This means we must look at the broader BI architecture.

To develop a Business-Centric BI Architecture for a given organization, one typically does a top-down mapping between business drivers, business strategies, and value-driving business processes – the same analytical pathway followed when designing a Balanced Scorecard. The processes diverge after the initial mapping because of different objectives: the Balanced Scorecard is designed to present key strategic performance measures, whereas the Business-Centric BI Architecture is aimed at specifying the ways that BI-business information, business analyses, and structured business decisions – can be used to *improve the core business processes that drive business performance and business value.* This divergence of purposes is illustrated in Figure 1.

Figure 1. Balanced Scorecard Mapping vs. Mapping to Design Business-Centric BI Architecture



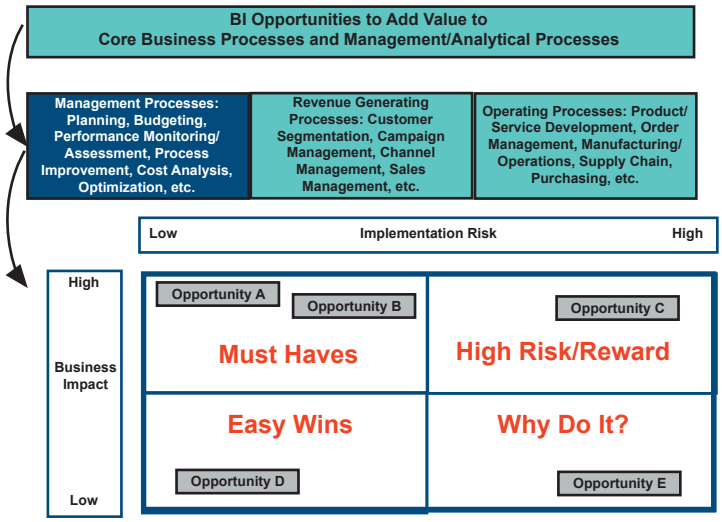
We can see from this analysis that a Balanced Scorecard initiative, while certainly strategic in focus and intent, is narrower in scope than the Business-Centric BI Architecture. The Balanced Scorecard seeks to understand how the organization is doing in a few key areas. The Business-Centric BI Architecture seeks to provide a framework for prioritizing and guiding the development of BI capabilities that deliver business information to support a broad set of business analytical applications (including Balanced Scorecards) and structured business decisions aimed at creating business value. **Given these relationships, implementing Balanced Scorecard software should not be a standalone project. Rather, it should be considered to be just one analytical application within the broader BI architecture.**

Aligning with the Business-Centric BI Architecture

A Business-Centric BI architecture is specific to each organization and encompasses the business information, business analysis methods and tools, and structured busi-

ness decision processes required by executives and managers to drive business results for the specific organization. Business-Centric BI development methods are aimed at ensuring that investments in BI pay off, and a central activity is a comprehensive top-down analysis of the opportunities to use BI to improve the business value created by management processes, revenue generating processes, and operating processes.[5] One outcome of the analysis is a BI Portfolio – a group of BI opportunities prioritized by potential business impact, or return-on-investment (ROI). This set of opportunities drives creation of the Business-Centric BI Architecture, which of course includes a BI data architecture and BI technical architecture. A high-level overview of the BI Portfolio is shown in Figure 2.[6]

Figure 2. The BI Portfolio Maps Opportunities to Impacts



Within the BI Portfolio illustrated by Figure 2, there will be opportunities aimed at improving management processes via BI – shown as the bright blue box. **The adoption of a Balanced Scorecard analytical application would be one potential opportunity–and probably one opportunity among many.** Accordingly, the business information requirements and technical requirements of the Balanced Scorecard software must be factored into the BI data architecture and BI technical architecture. That said, those same requirements must be rationalized with the information and application requirements of other BI applications within the portfolio if we are to avoid the well-known costs of stove piped applications. Figure 3 illustrates the need for alignment between information requirements.

Figure 3. Aligning Business Information Requirements between Balanced Scorecard and Other BI Applications

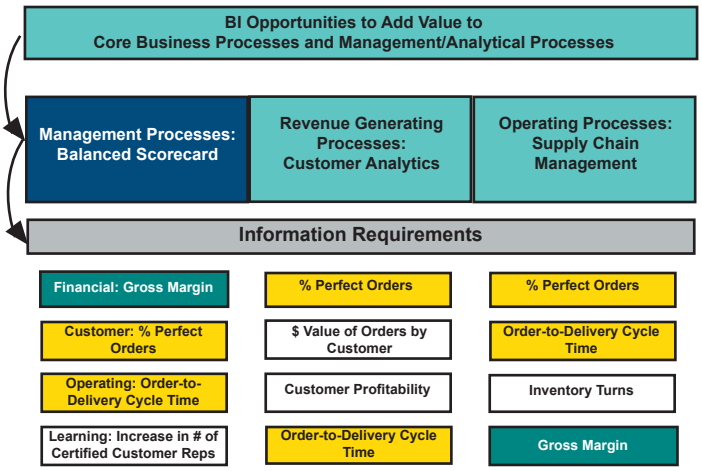


Figure 3 shows a simplified view of 3 potential BI opportunities within the BI Portfolio – the Balanced Scorecard (management process) opportunity, a customer analytics (revenue generating process) opportunity, and a supply chain management (operating process) opportunity. Each opportunity drives the need for certain information, and the information within the yellow boxes is common to all three opportunities. In addition, two of the three opportunities have a common need for gross margin information, shown within the green boxes. This simple example illustrates the need for alignment within the Business-Centric BI Architecture between Balanced Scorecard application software and other BI applications. Business-Centric BI development methods address this need for business, data, and

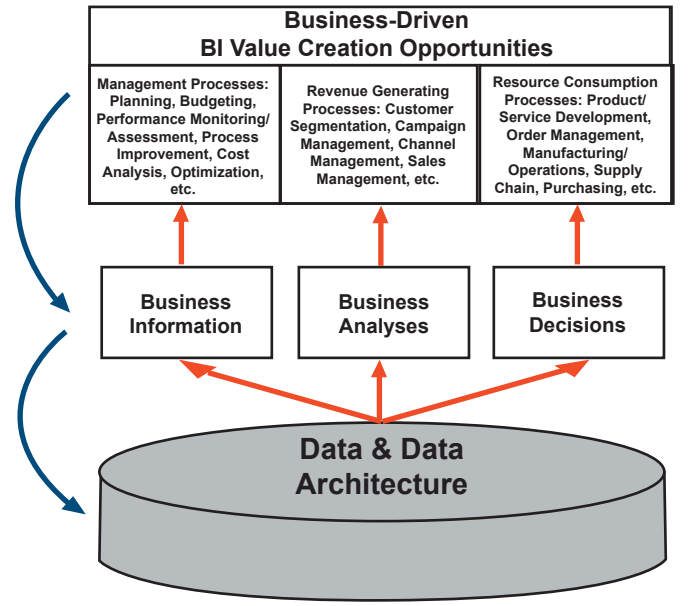
technical alignment by systematically looking at the information requirements of all relevant BI opportunities in the BI Portfolio and then designing data architectures and technical infrastructure to deliver the required information. This approach avoids deployment of yet another stove piped BI application and leverages technology infrastructure where advisable.

Data Issues and Balanced Scorecard Software

One of the key assumptions in almost all of the books, articles, and other literature about the Balanced Scorecard is that the performance measurement data required for using the performance management framework is readily available. Based on our experience with major private sector and public sector organizations, and based on BI and data warehousing experience generally, we believe this is really a huge leap of faith. In fact, in a 2001 survey by IDC and the Balanced Scorecard Collaborative, survey respondents from a broad range of industries stated that complex data sourcing remains the single biggest challenge to automating Balanced Scorecards, followed by the unavailability of needed source data.[7] This situation raises the questions we posed earlier: how should the performance measurement data required for a Balanced Scorecard be acquired, staged, and managed and how does that approach fit within the overall Business-Centric BI Architecture?

As more and more organizations move beyond early-stage, reporting-oriented data warehousing initiatives toward business-centric deployment of BI to create business value, they will be faced with the business requirement to identify the types of business information and business analytics they will need – across the board – so that the BI Portfolio can be managed as a rational series of investments that results in a high return on investment, reasonable time-to-value, and optimal total cost of ownership. From a data perspective, this means taking a broader look at the specific data architecture required by the business and then developing the appropriate data stores – probably in increments. Within this approach, a Balanced Scorecard initiative is just one application in the portfolio, albeit a strategically important one. This conceptual approach to developing a Business-Centric BI Data Architecture is shown in Figure 4.

Figure 4. Business-Centric BI Data Architecture



The basic analytical flow is from business drivers to business strategies to business processes to BI opportunities, as shown earlier in Figure 1. Once we know the BI opportunities in which we are interested, potentially including Balanced Scorecards, we can systematically analyze (blue arrows in Figure 4) the business information, business analyses, and structured business decisions for which we need to provide data and then design the appropriate BI Data Architecture that supports those requirements. In an existing data warehouse and BI environment, this analysis and design path will need to look at the existing data architecture and infrastructure and determine how to evolve the data architecture to accommodate the Balanced Scorecard initiative and

other analytical applications. Absent such an approach, implementation of a Balanced Scorecard would resemble the all-too-common rapid deployment of a standalone application with standalone ETL processes and a standalone data model.

In designing the Business-Centric BI Architecture, we need to pay particular attention to the types of performance measurement data required by Balanced Scorecards and the overlapping requirements that other analytical applications have for the same data, illustrated earlier by Figure 3. As ably explained by Leo Voskamp in the October 2003 issue of *DM Review,* there are a number of data complexities associated with scorecarding, including the fact that many measures can't simply be aggregated and disaggregated like many standard BI applications and many are not additive.[8] Given these complexities, this means that special-purpose data models must be used.

Ideas to Action

In many cases, the impetus for acquiring Balanced Scorecard software will come from a desire to overcome the data management complexities associated with acquiring performance measurement data on an ad hoc basis from multiple sources, integrating that data via spreadsheets, presenting that data via PowerPoint or other graphical tools, and keeping the data for historical trend analysis. Balanced Scorecard applications software is available from 19 vendors (all the major BI applications and ERP vendors) whose products have been certified by the Balanced Scorecard Collaborative (BSC). The functional requirements for Balanced Scorecard applications amount to being able to:

• Associate multi-dimensional business facts, business information, and meta-data with the specially-named entities used by the Balanced Scorecard performance management framework: Perspectives (financial, customer, internal, and learning), Objectives, Measures, Cause-and-Effect Relationships, Targets, and Initiatives.

• Map various relationships between the specially-named entities.

• Generate standard reports in a scorecard format and provide graphical performance status indicators–such as the familiar "stoplight" display using red, yellow, and green indicators.

• Provide drill-down and slice-and-dice capabilities.

It is clear from these BSC functional requirements that any of the major desktop OLAP tools can be used to do this without difficulty. Accordingly, organizations considering Balanced Scorecard software would be well advised to conduct a systematic build-or-buy analysis. Further, any scorecard application should be evaluated in the context of a Business-Centric BI Architecture. Absent such analyses, the risk is that the Balanced Scorecard software initiative will populate the organization with information that conflicts with the same type of information provided by other analytical applications, thus eroding business confidence in one or the other. Balanced Scorecards, done right, are a proven tool for improving business performance. They need good data to succeed–data that is consistent with other essential performance management applications used by the organization.

References

1. A Business-Centric BI Architecture defines a portfolio of BI applications that are explicitly aligned with the primary business processes that a given business uses to satisfy customers and earn a profit for shareholders. The BI Portfolio is managed as a series of investments designed to create business value by improving the efficiency and/or effectiveness of the key value-driving business processes. For more, please see Williams, S. and Williams, N. "Trend: Business-Centric BI Development Methods" DM Review August 2004

2. For more information on the Balanced Scorecard, go to the Balanced Scorecard Collaborative web site.

3. Rigby, D. "Management Tools and Techniques: A Survey" California Management Review Volume 43, Number 2, Winter 2001

4. See Balanced Scorecard Functional Release Standards™ Release 1.0a, The Balanced Scorecard Collaborative, Inc. May 5, 2000.

5. Op. Cit., "Trend: Business-Centric BI Development Methods"

6. Ibid. (figure is adapted from the original)

7. Morris, H. "The BSC and Analytic Application Integration" Balanced Scorecard Report January-February 2002

8. Voskamp, L. "Going from the Unacceptable to the Exceptional: The How and Why of Balanced Scorecarding," DM Review October 2003

About the Author

Steve Williams is President of DecisionPath Consulting, which provides business intelligence and data warehousing strategy, solutions design, systems integration, and BI process engineering services to Fortune 1000 companies and Government agencies. His expertise is in business strategy, IT strategy, BI applications, and business process engineering. Steve holds an MBA from the University of Virginia and has published articles and book chapters on BI, IT strategy, supply chain IT, and e-business. Comments about this article are welcome, and Steve can be reached at steve.williams@decisionpath.com.

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For more information contact:

DecisionPath Consulting
Six Montgomery Village Avenue, #622
Gaithersburg, MD 20879
301-926-6752
www.decisionpath.com

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