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Business Intelligence can help management accounting reclaim its relevance and rightful role.

BY STEVE WILLIAMS

The term “business intelligence” was spawned in the 1990s to convey the concept that businesses can harness the blizzard of transactional information generated by their IT systems to gain substantial insights into emerging profit opportunities. By integrating transactional data in appropriate databases, companies can use a common set of business facts for analyzing revenue and cost drivers, launching profit improvement initiatives, measuring and managing business performance, and deploying decision support applications such as activity-based costing (ABC), supply chain analytics, customer analytics, scorecards, dashboards, optimization models, and simulations. Well-known companies in a wide range of industries have already realized some of the promise of business intelligence (BI), and the underlying methods and technologies for delivering business value are well established. For example, Avnet, Barclays, BellSouth, Ford, HP, Nationwide, and Sears have established BI programs that have been used to drive revenues, reduce costs, or both.

During roughly the same period when BI was emerging, management accountants were embarking on the mission to reclaim their relevance. With the publication of *Relevance Lost—The Rise and Fall of Management Accounting* in 1987, Thomas Johnson and Robert Kaplan initiated discussion of how and why management accounting had become irrelevant for planning, control, productivity management, pricing, and other fundamental management tasks. More importantly, they challenged management accountants—practitioners and academics—to reclaim the original focus of management accounting on resource management and to capitalize on modern information technology to deliver information that is more relevant and timely.

Since then, the challenge has begun to be answered. Kaplan, Robin Cooper, David Norton, Peter Drucker, Gary Cokins, and others have refined our thinking about the types of information managers need. Innovations such as ABC and scorecards have been adopted to good effect in a number of industries. The role of management accounting and management accountants is being expanded. Even so, many practitioners believe that the potential of business intelligence technology for delivering dramatically expanded management accounting information has just begun to be realized. BI offers affordable tools for delivering a wide variety of relevant management accounting information for planning, control, productivity management, pricing, and other fundamental management tasks. And BI can help management accounting reclaim its relevance and assume the key strategic role it needs to play if companies are to succeed in today's fast-paced global economy.

MANAGEMENT ACCOUNTING'S EVOLUTION

As Johnson and Kaplan describe in *Relevance Lost*, management accounting evolved during the industrial revolution as a tool for measuring and managing resource consumption, output, and productivity at the operational level of a company. Early management accounting systems were devised by industrial engineers, who traced resource consumption at each stage of production/conversion and compared consumption with engineered standards, with targeted outputs, and, in some cases, with revenues. The primary focus was on providing information for planning and controlling the productivity and efficiency of internal processes. These systems made no attempt to associate period costs with units of output because the focus was on controlling resource use at the operational level. Other key system attributes were that

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they provided relevant industry-specific information and combined financial and nonfinancial information. As a whole, the information provided was directly relevant to the operations management task of optimizing cost, time, asset utilization, and service.

Over time, the standard costs calculated by the early management accounting systems began to be used for more strategic purposes, such as pricing, financial reporting, and investment analysis. That meant it became necessary to account for period costs to ensure that pricing decisions considered all costs, that investments returned cash inflows in excess of projected cash outflows, and that period costs were allocated between inventory and cost of goods sold. Thus began the process of allocating indirect costs to units of output, which had the effect of making reported cost information less relevant for the original purposes of planning, controlling, and improving productivity and efficiency.

MODERN DEMANDS FOR MANAGEMENT ACCOUNTING INFORMATION

Today, most observers agree that management accounting information derived from financial accounting systems is obsolete. A review of management accounting literature finds this theme repeatedly, and discussions with operating managers in a variety of industries reinforce it.

For example, during my company's work with a \$7 billion service organization to modernize their management accounting system, we conducted dozens of interviews at all levels of the organization, and we identified the need for:

1. Information about the direct costs of delivering each type of service offered to customers;

2. Cost information that is specific to each of the 1,500 field offices as opposed to average cost information;
3. Cost-to-serve information that allows for comparisons by service delivery channel, service line, and type of customer;
4. Activity-based costs for assigning indirect costs based on cause-and-effect relationships;
5. Physical output information and demographic information about the 1,500 field offices;
6. Full cost information for budgeting and pricing purposes; and
7. Relevant cost information for process improvement and capital budgeting.

Basically, the current system generates incomplete information in which the organization's managers have no confidence. And yet the managers use that information because they have nothing better. The organization also lacks information for systematically, consistently, and routinely performing fundamental operations management trade-offs among asset levels, costs, process times, quality, service, outputs, and backlogs. Unfortunately, this organization is all too typical.

If we take a broader, cross-industry look at today's management challenges, we see that the economic trade-offs among costs, time, service, quality, asset levels, outputs, and backlogs are still the fundamental operations management concerns. The need for relevant management accounting information is even greater when you consider the trend toward competition based on the performance of constellations of organizations within value chains. We observed this firsthand when we were engaged by a \$2 billion food ingredients manufacturer for a supply chain collaboration and optimization project with an international fast food chain. We could get some relevant information through ad hoc studies but not from the manufacturer's systems or from other members of the supply chain. Yet this is exactly the type of information we needed to optimize operations and operating profits among the companies in the extended enterprise.

WE NEED MORE

Management accounting deficiencies point to the need for expanded functionality and for an expanded role for

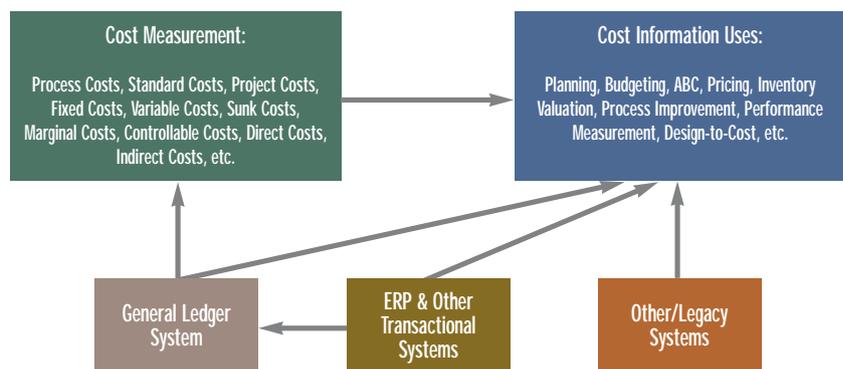
the management accounting function. To see the differences between where we are and where business intelligence can take us, let's first examine traditional management accounting systems and the management tasks they support, as shown in Figure 1.

Figure 1 shows a representative management accounting framework that is concerned only with costs and not with the broader set of financial and nonfinancial information found in early management accounting systems. For cost measurement, the information is drawn from the general ledger (G/L) system, which is sometimes part of an enterprise resource planning (ERP) system. Expenses are allocated into a cost accounting model—e.g., a standard cost, project cost, or process cost model—depending on the business. The costs are then reported periodically, at various levels of aggregation, according to a taxonomy of cost objects such as organizational unit, product line, customer, and/or other object of management's attention. The reported costs then serve as raw materials for various cost information uses, as shown in the upper right-hand box. Figure 1 also shows some of the commonly encountered issues associated with traditional cost accounting systems. To move beyond these limitations, we need to provide a modern conceptual framework for management accounting information, as shown in Figure 2.

The modern Management Accounting Information Framework (MAIF) encompasses broader information than a traditional cost accounting framework, including not just information about costs but also information about assets, quality/service, time (e.g., cycle time), and

Figure 1: Traditional Management Accounting Information Framework

TYPICAL ISSUES: (1) Multiple sources of cost information; (2) Ad hoc use of cost information from multiple sources with different data structures/assumptions; (3) Single cost measurement framework, e.g., standard costs, that is not suitable for all uses; (4) Limited/no ability to integrate cost, time, quality, output, and asset information for integrated analysis and trade-offs; (5) Undue reliance on financial accounting information as substitute for management accounting information.



outputs. The MAIF is built upon a single integrated source of information that is simplified and shown functionally as a “data warehousing/business intelligence” (DW/BI) environment. This environment draws relevant, broad-based management accounting information from appropriate sources of transactional information, as shown at the bottom of the figure.

Properly designed, and built from proven DW/BI products, the MAIF serves as a relatively inexpensive yet robust source of management accounting information that can be used to:

- ◆ Improve management processes such as planning, budgeting, control, and performance improvement, and
- ◆ Improve specific key business processes that impact revenues and/or costs, such as the “customer order to cash” processing cycle.

A customized MAIF would allow companies to address the key deficiencies associated with traditional management accounting systems by:

1. Providing a single, integrated source of relevant cost information for the various uses shown in Figure 1;
2. Eliminating time-consuming and idiosyncratic ad hoc searches for information from multiple sources, which changes the conversation from “Where did you get those numbers?” to “What do the numbers mean?” and “What does the analysis show?”;
3. Enabling the use of multiple cost measurement taxonomies, each customized to provide relevant costs for specific decisions and uses and yet each footing to the G/L;
4. Expanding the scope and relevance of management accounting by providing information about assets, outputs, quality/service, and time, thus integrating “what were once several procedures—value analysis, process analysis, quality management, and costing—into one analysis,” according to Peter Drucker; and

Figure 2: Modern Management Accounting Information Framework

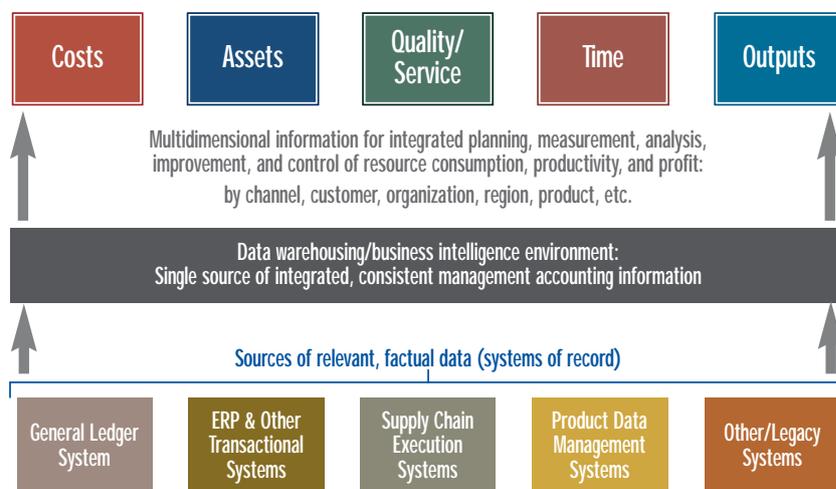
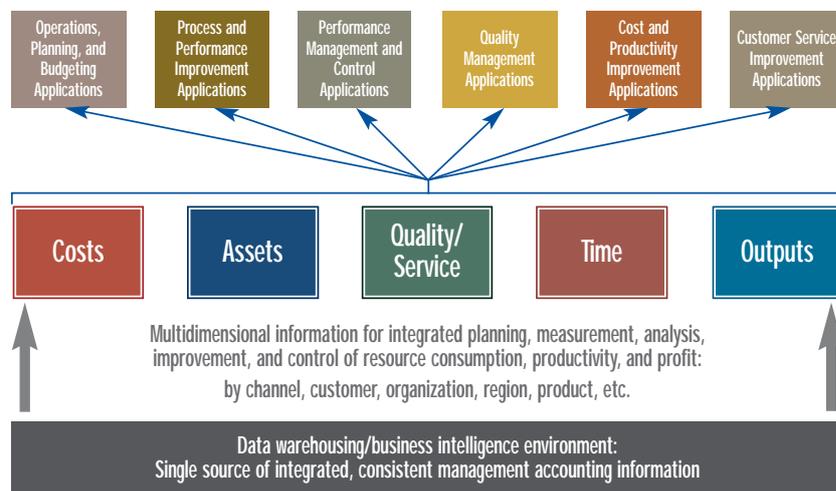


Figure 3: The Modern Management Accounting Information Framework Supports a Variety of Resource Management Applications



5. Reducing reliance on financial accounting information, which is a poor substitute for relevant management accounting information.

The DW/BI products from which the MAIF can be constructed are proven and widely adopted. So are the management and technical methods for doing so.

LEVERAGING INFORMATION

With a customized MAIF in place, an organization can leverage management accounting information to improve revenues, reduce costs, or both. This is accomplished by deploying BI applications and embedding their use within the key business processes that drive revenues and/or

costs. An example of the range of such applications is shown in Figure 3.

Here are some examples of how an MAIF—based on data warehousing and BI applications—could be used:

- ◆ Avnet, Inc. is one of the world’s largest industrial distributors of electronic components, network and computer equipment, and embedded subsystems, with 2003 sales of \$9.05 billion. Avnet uses DW/BI technologies to provide a complete picture of its worldwide inventory position so that it can improve its supply chain management processes and increase profits.

- ◆ Barclays Bank is one of the largest banks in the U.K., with more than \$600 billion in assets, 10 million individual customers, and one million business customers. Barclays uses DW/BI technology to understand the major profitability drivers of its loan business and to segment its customers based on lifetime value so that it can offer targeted, differentiated services and pricing.

- ◆ Ford Motor Company is the world’s second-largest automaker, and Ford Parts Supply and Logistics (PS&L) supplies 5,900 authorized dealers with service parts for 50 million vehicles. PS&L has more than 2,000 suppliers, hundreds of thousands of parts, and more than one million SKUs in 13 North American distribution facilities. It uses DW/BI technology to improve order fill rates (improve customer service) while reducing safety stock levels (improve asset utilization).

There are many other examples of how leading companies in a variety of industries are using enhanced management accounting information to drive improved profitability.

A SINGLE VIEW OF THE TRUTH

Two central premises of DW/BI are: (1) Historical information about past transactions is essential to a variety of analytical frameworks used to manage organizational performance, and (2) all such analytical frameworks should operate from the same set of facts—the so-called “single view of the truth.” The MAIF allows an organization to leverage historical information and analytical frameworks for profit improvement by using a central data integration facility—the DW/BI environment—to create a data asset that can be used for analytical applications, such as those shown in Figure 3. Table 1 provides an example of integrated, broad-based management accounting information that can be deployed within an MAIF.

It is a simplified example of how integrated transactional information can be staged in a DW/BI environment to provide an expanded scope of management accounting information. From this information, you can derive/calculate a range of historical information that can be used for a variety of managerial purposes, such as:

1. Demand information (Columns D and E) for forecasting, sales and operations planning, customer segmen-

Table 1: Example of Integrated, Expanded Management Accounting Information

	A	B	C	D	E	F	G	H	I	J	K
1	Customer	Transaction	Order #	Invoice Amount (\$000)	Order Date	Request Date	Promise Date	Ship Date	Receipt Date	Order Cost	Order Margin
2											
3	BigCo	1	123	100	1/2/2003	1/5/2003	1/5/2003	1/5/2003	1/6/2003	60	40
4		2	789	90	2/1/2003	2/4/2003	2/5/2003	2/6/2003	2/7/2003	60	30
5		3	234	110	3/1/2003	3/3/2003	3/4/2003	3/4/2003	3/5/2003	70	40
6		4	654	120	4/2/2003	4/5/2003	4/5/2003	4/5/2003	4/6/2003	75	45
7	Year-to-Date			420						265	155
8											
9	MidCo	1	243	75	1/2/2003	1/5/2003	1/5/2003	1/4/2003	1/5/2003	30	45
10		2	536	80	2/1/2003	2/4/2003	2/4/2003	2/3/2003	2/4/2003	35	45
11		3	768	85	3/1/2003	3/3/2003	3/3/2003	3/2/2003	3/3/2003	40	45
12		4	127	70	4/2/2003	4/5/2003	4/5/2003	4/4/2003	4/5/2003	25	45
13	Year-to-Date			310						130	180

tation, budgeting, customer relationship management, and other applications that require historical demand information;

2. Cost information (Column J) that can be used to calculate margins by customer, product, region, organizational unit, and the like and that can be employed for typical cost management uses;
3. Quality/service information for various customer service measures, such as number of orders shipped by customer's original request date (Columns F and H) and number of orders shipped by promise date (Columns G and H); and
4. Time information, such as order-to-ship cycle time (Column E – Column H).

Again, Table 1 is a simplified example. An actual DW/BI environment for a customized management accounting system typically would contain:

- ◆ Three years of transactional history to enable trend analyses;
- ◆ Details of all transactions so that facts could be analyzed in ways that the company might not anticipate at the time the system is designed;
- ◆ Data to meet the specific management accounting requirements based on business needs of the specific organization;
- ◆ Third-party data, such as benchmarking data, market research data, and customer data; and
- ◆ All potentially relevant financial data from the G/L to support various cost analyses and to provide control totals.

Armed with today's DW/BI technologies and methods, management accountants have the potential to deliver much richer management accounting information to support fundamental management processes that create economic value. Business intelligence is proven in enterprise settings, often in sales and marketing applications, but increasingly in operational settings. These technologies and methods are just beginning to be exploited for management accounting purposes, which creates substantial opportunities to increase the strategic relevance of the profession and the function. As always, however, there are challenges to overcome.

CHALLENGES AHEAD

There's no question from a technical perspective that DW/BI technologies and methods can be used to acquire, stage, and deliver expanded management accounting information that can be used as the basis for:

- ◆ Analyzing revenue and cost drivers;

- ◆ Launching profit improvement initiatives;
- ◆ Measuring and managing business performance;
- ◆ Deploying decision support applications, such as forecasting models, optimization models, and simulations;
- ◆ Defining management response paths for recurring and semi-recurring business events, such as budget variances or operational performance variances; and
- ◆ Enabling management control applications such as supply chain analytics, customer analytics, scorecards, and dashboards.

Further, the value of DW/BI technologies is gaining recognition within the management accounting community. For example, in their article from the November/December 2003 issue of *Cost Management*, "Interface Between ABC/M Requirements and Multidimensional Databases," Bala V. Balachandran and K. Shyam Sundar examine the requirement for ABC/M systems to:

1. Integrate data from the financial accounting system with data from various other systems, such as human resources systems and production and operational control systems;
2. Collate multidimensional information into "appropriate baskets of information based on the objective for which the information is going to be used";
3. Enable the use of multiple complex cost models, depending on the multiple analytical requirements of the organization; and
4. Examine the same set of costs as activity, product, customer, or channel costs, as well as from traditional resource cost center and accounting viewpoints.

Just as DW/BI technologies are fundamental to meeting these ABC/M requirements, they are equally fundamental for the broader-scale data integration and expanded information delivery capabilities ascribed to the modern Management Accounting Information Framework.

To get to the point where these technologies are fully exploited for broadly defined management accounting purposes, organizations will have to deal with the next three key challenges.

Organizational Support for an Enhanced Management Accounting Role

The suitability of DW/BI technologies and methods for an expanded management accounting capability is a moot point unless CEOs, COOs, and/or CFOs believe such a capability will have an impact on profits. While there are exceptions, the history of DW/BI adoption

further reading

Here are a few pieces about the evolution of management accounting that you might want to reread:

H. Thomas Johnson and Robert Kaplan, *Relevance Lost—The Rise and Fall of Management Accounting*, Harvard Business School Press, Boston, Mass., 1987.

Gary Cokins, "Chapter 1," *Activity-Based Cost Management—An Executive's Guide*, John Wiley & Sons, New York, N.Y., 2001.

Robert Kaplan, "One Cost System Isn't Enough," *Harvard Business Review*, January/February 1988.

Robin Cooper and Robert Kaplan, "Profit Priorities from Activity-Based Costing," *Harvard Business Review*, May/June 1991.

Peter Drucker, *Management Challenges for the 21st Century*, Harper Business, New York, N.Y., 1999.

suggests that individual, functionally oriented projects are the norm. An enhanced MAIF would require an enterprise asset approach whereby the DW/BI investment would be seen as benefiting the full spectrum of organizational uses for cost, time, asset, output, and quality/service information.

Getting to this perspective could be tough sledding, given such factors as the organizational culture around information use, decision-making styles, the level of IT sophistication, the degree of "pain" the organization is experiencing with respect to performance, and other situational variables. A key factor is the CFO's interest in the opportunity. Many CFOs are preoccupied with meeting Wall Street earnings expectations and Sarbanes-Oxley requirements. Further, they may have invested multiple millions in ERP. Accordingly, they may not want to champion an initiative to enhance management accounting capabilities, particularly if they believe that the ERP system's management accounting module provides all the functionality required or that is desirable from a profit improvement perspective (even though that's unlikely). Because of this perspective, it can be argued that the COO has a more immediate interest in championing an enhanced management accounting system and that man-

agement accounting resources should be placed under his/her purview.

Custom Systems vs. Packaged "Solutions" (Make-or-Buy)

Recently, business intelligence software product vendors (who tend to be specialized small-cap companies with less than \$1 billion in revenues) have begun offering packaged "solutions" that would provide some of the capabilities ascribed to the MAIF. These products fall within loosely defined, overlapping categories, such as:

- ◆ Packaged analytical applications, such as supply chain, customer, and financial analytics;
- ◆ Business performance management (or corporate performance management) applications, such as dashboards, scorecards, and benchmarking metrics;
- ◆ ABC/M applications;
- ◆ Planning and budgeting applications; and
- ◆ Supply chain planning and optimization applications.

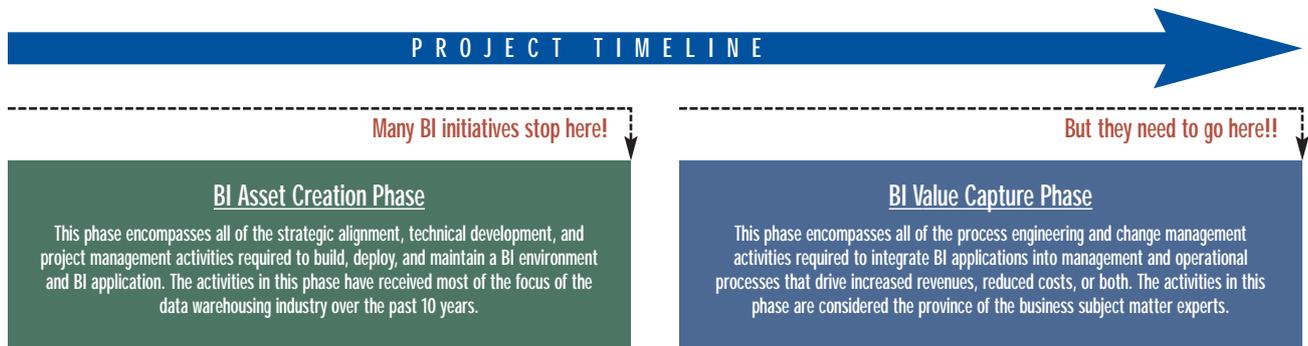
In addition, the major ERP vendors now offer canned data warehouses with business intelligence applications such as those listed above.

These packaged "solutions" tend to be positioned as offering rapid time to value, embedded industry-specific BI "best practices," built-in industry benchmarking data, and support for collaborative management and decision processes, among other features. Determining the appropriateness of such "solutions" for a particular organization is a complex undertaking, made more difficult by vendor marketing practices that make it difficult to "look under the hood."

At the other end of the continuum are custom systems—systems that are custom-designed and then built with standard, commercially available BI and data warehousing software products. The "solutions" vendors attempt to portray custom systems as risky, time-consuming, and expensive infrastructure projects—as if they were being hand-coded using 1980s development tools. In fact, the custom systems and the packaged "solutions" are built with the same piece parts using the same methods, the primary difference being that the "solutions" vendors have already made a variety of design choices that affect:

- ◆ What data are available;
- ◆ How data are defined and named;
- ◆ How data can be permuted and aggregated/disaggregated;
- ◆ What data can be integrated;
- ◆ How data can be viewed and manipulated; and
- ◆ Degree of business process change involved.

Figure 4: The BI Value Capture Process



These design choices have a substantial impact on the potential business value of the packaged “solution” for a given organization.

There are complex trade-offs in reaching a make-or-buy decision that’s appropriate for a given organization. These decisions ultimately affect the utility and ROI of the management accounting information environment that is deployed.

Capturing BI’s Full Business Value

In economic terms, the business value of an investment in a modern Management Accounting Information Framework (MAIF) would be the net present value of the after-tax cash flows associated with the investment. The implications of this fundamental economic truth are that any MAIF must be used to:

- ◆ Improve management processes—such as planning, controlling, measuring, monitoring, and/or changing—so management can increase revenues, reduce costs, or both; and/or
- ◆ Improve operational processes—such as fraud detection, sales campaign execution, customer order processing, purchasing, and/or accounts payable processing—so the business can increase revenues, reduce costs, or both.

To achieve these things, the enhanced information about costs, time, quality/service, assets, and outputs must become an integral part of the management and business processes used to drive revenues and manage cost drivers. This requires moving beyond the “asset-creation phase”—the deployment of the MAIF—and actively managing a “value-creation phase” as shown in Figure 4.

The central premise of a “value-creation phase” is that the use of business intelligence in general, and management accounting information in particular, can and should be engineered. This is in contrast to a philosophy being espoused by packaged “solutions” vendors whereby

the packaged “solutions” are broadly deployed (thousands of licenses) at all levels of an organization on the assumption that people in the organization will develop all kinds of creative uses for information and that these uses will favorably affect revenues, costs, and profits. (For an in-depth discussion of value creation with BI, see Steve Williams and Nancy Williams, “The Business Value of Business Intelligence,” *Business Intelligence Journal*, Fall 2003.)

RETURN TO OUR ROOTS

Data warehousing and business intelligence technologies and methods have tremendous potential for improving and expanding the scope of management accounting systems. It is a “back to the future” opportunity whereby management accounting can return to its roots and deliver operationally relevant, industry-specific information about resource utilization, productivity, and profit. A modern Management Accounting Information Framework can flexibly deliver cost, time, asset, output, and quality/service information to meet a wide spectrum of information uses that can improve management and/or business processes that impact profits. To realize this potential, organizations must decide that it is important, make sound make-or-buy decisions, and embed the use of expanded management accounting information into the management and business processes that drive profits. ■

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