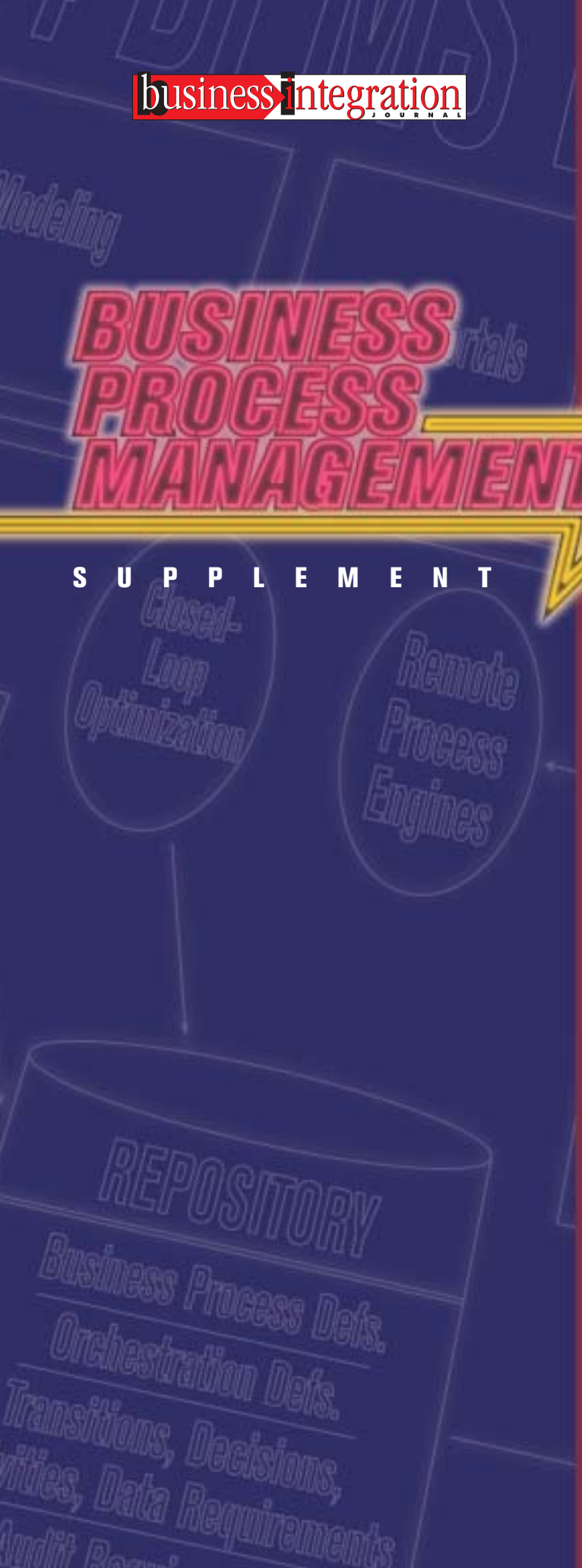

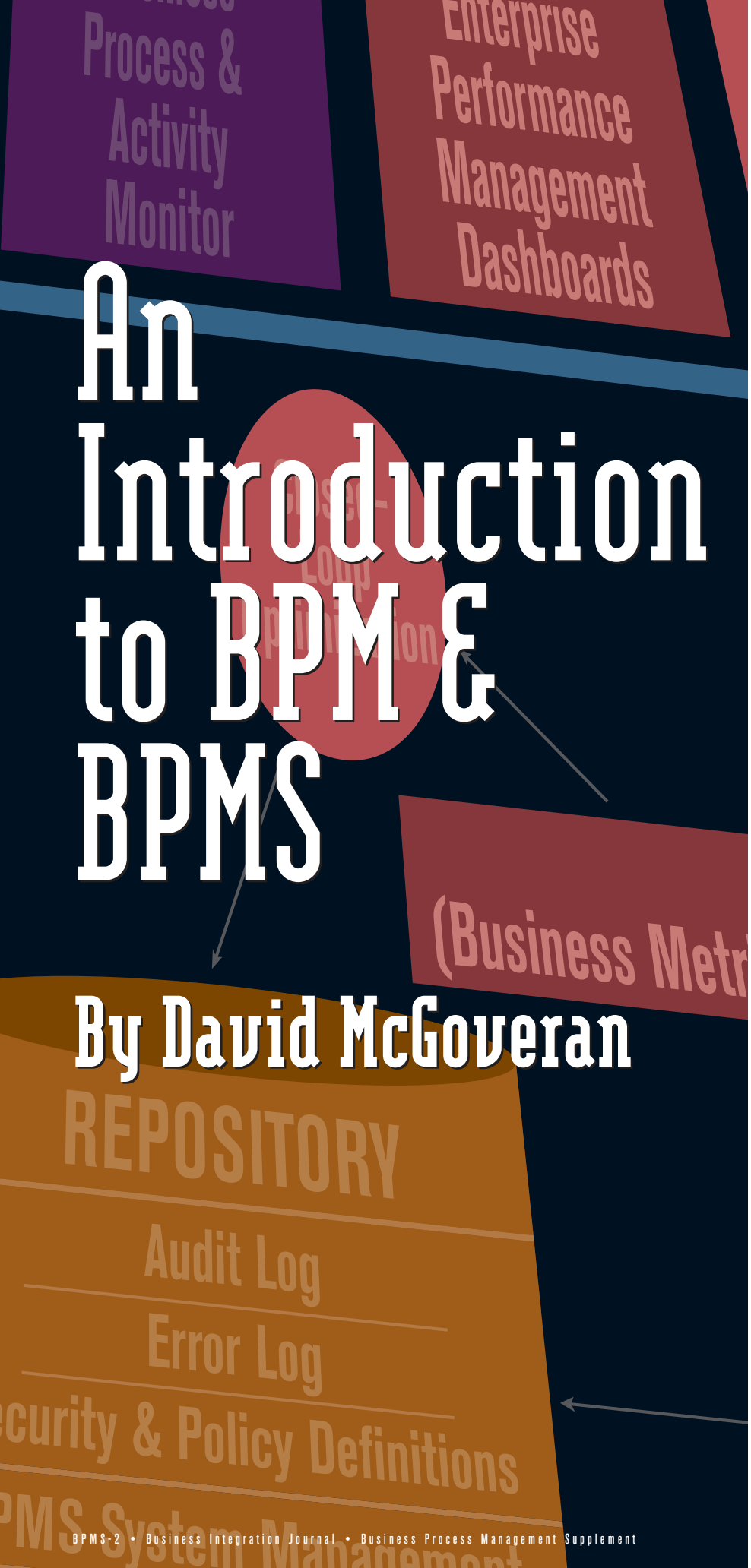


# An Introduction to BPM & BPMS

By David McGoveran

The phrase "business process management" and the BPM acronym are used in multiple ways. Most usages are imprecise and informal, with the result that discussing BPM often generates more confusion than clarity. In this article, we take the position that BPM properly refers to a theory or strategy of business management that precedes and forms the foundation for a rapidly evolving, extremely valuable, though immature, technology solution. BPM technology solutions comprise multiple components, a suite of which may be referred to generically as a business process management system (BPMS). To understand the technology and why it's different from its predecessors, let alone how to use it, we must first understand the business principles that underlie BPM.

In this article, we'll review some informal, albeit common, uses of BPM, provide a more formal definition that departs from some of the informal uses, and discuss some important BPM principles. We then consider the technology for supporting BPM as a business management strategy.

## Business Process Management

Informal uses of the phrase BPM are not only common, but often incompatible, and are proliferating. The cause of this situation is threefold:

The phrase BPM isn't new and has evolved from a history of usage in related business process fields such as business process improvement, business process reengineering (BPR), and business process innovation. The supporting technologies have evolved from earlier technologies for workflow management, EAI, process automation, process integration, process modeling, process optimization, and so on.

The rapid success of BPM-related technologies in recent years has motivated both vendor marketing departments and industry analysts to define the term, each to their own advantage.

Because maturation of BPM discipline and technology is likely to continue, with both academic and industrial research increasing in pace, our understanding of what should constitute the best formal definition will continue to evolve.

To analysts and most members of the press, BPM is a rapidly growing market category that has developed over the last five years, but which is merely a rebirth of old ideas. Many types of products and services are included in this category, such as those for business process model-

ing, BPR, business process automation, process integration, process analysis, process monitoring, workflow management systems, and process-driven development.

Many analysts either don't differentiate between BPMS and workflow management systems, or treat BPMS merely as providing workflow management integrated with an EAI infrastructure or Web services capabilities. There are both business and technical aspects of this issue. Presumably, BPM products and services belong to the BPM category not merely because the vendor has decided it's good market positioning, but because they have something in common. By the time you finish reading this BPM supplement, that "something" should be a bit clearer.

There are many who think of the BPM discipline as being rooted in BPR. Most of the early uses of BPM referred to the collective thinking associated with BPR and, to a lesser degree, with continuous process improvement and process change. This can be seen in, for example, articles of the *Business Process Management Journal*, the first issue of which was published in 1995. Until Vol. 2, 2001, when the *BPM Journal* espoused a "new vision," most of the published articles focused on BPR. Thereafter, it began to broaden its focus somewhat, although it still "defines" BPM as—to paraphrase—"distilling and applying the wisdom of reengineering to business processes."

One might think that, because the Business Process Management Group was founded in 1992, BPM was a common phrase dating at least from the early '90s. However, prior to 1996, when the group changed its name to "reflect a broader interest in sustaining process improvements," it was called the Business Process Reengineering Study Group. The 5,000-member group is "a global business club, exchanging ideas and best practices in business process and change management."

Although workflow management has its roots in office automation and document processing, it has evolved to encompass many types of workflow. The relationship between business processes and workflows is still being examined in the academic research literature, but two views are dominant and neither treats business process and workflow as identical.

The standard model of a workflow is as a special, well-defined, highly structured, and repeatable type of business process in which a "case" (an abstract document) is modified as it flows through a sequence of tasks. The workflow engine responds to these changes to determine routing. By comparison, a real-world business process definition isn't as rigidly constrained and may not admit of the case abstraction without overly convoluted thinking. As such, it's a generalization of workflow concepts.

The second view treats business process as a conceptual entity, while the workflow is its reduction to practice. This view has led many to use business process management as a synonym for "advanced" workflow management. This view often motivates the merger of business process modeling and BPR methodologies with those of workflow management.

Several technical organizations have been important in this evolution:

- The Workflow and Reengineering International Association (WARIA) was founded in 1992 and has as its charter "to identify and clarify issues that are common to users of workflow, electronic commerce and those who are in the process of reengineering their organizations."
- Workflow Management Coalition (WfMC) is the international, standards-setting organization of workflow vendors, users, analysts and university/research groups. In recent years, it has increasingly characterized its work as relating to BPM.
- The first group to address BPM directly was BPMI.org, founded in 1999, which has as its mission "to promote and develop the use of business process management (BPM) through the establishment of standards for process design, deployment, execution, maintenance, and optimization." The approach the organization takes to business processes is predominantly as an extension of the workflow paradigm, both in terms of terminology, standards compatibility, and conceptualization, and which emphasizes process-to-process correlation.

### Principles of BPM

The phrase BPM first became popular in the context of business management strategies relating to business process in the mid-'90s. However, its meaning has changed over time, slowly usurping its predecessors. As a management theory or strategy, BPM can be characterized by a number of principles. Although a great deal has been written about BPM technology and its benefits, little has been written about the business principles that *implicitly* underlie both the successful use of that technology and the vision of its future. These principles have a firm grounding in the history of business process and management theories.

In this section, we consider these business principles, taken together, to be the current, formal meaning of BPM, and so will attempt to elucidate an *explicit* definition. A little history of business process thinking will help the reader understand the relationship between current BPM and its predecessors, from which it inherits much. As a pedagogical device, we'll use this history to introduce the principles, with the warning that no particular importance or meaning is implied by the order of presentation.

As a working definition, we treat BPM simultaneously as a theory and associated group of methods, both for the management of business from a process perspective and for the management of business processes. The first part of this definition entails a *strategic* business management position statement with far-reaching consequences. In particular, BPM is *a commitment to expressing, understanding, representing, and managing a business* (or the portion to which the theory is being applied) *in terms of an interdependent collection of business processes responsive to an environment of internal and external events.*

Adopting this idea simultaneously forces us to treat our business processes in a comprehensive, dynamic manner and to recognize business activities that aren't a part of some business process as being both unnecessary and undesirable. In this view, a business process is an interdependent set of business activities and decisions that mediate their inter-relationships, regardless of how repeatable that process is, how spontaneously it's defined or redefined, how well it's documented, or how aware human participants are of its existence.

Every business process is identifiable with at least one objective and its degree of success is either qualitatively or quantitatively measurable. Because the business is understood in terms of its business processes, it's through the management of business processes that the business is to be managed. The ideal BPM approach isn't one of forcing an organization to behave in a certain formal way, but rather of understanding that behavior through BPM concepts and principles. This is a knowledge discovery process, at times requiring considerable effort.

The second part of this definition also entails an *operational* position statement. By "management of business processes," we include process analysis, process definition and redefinition, resource allocation, scheduling, process management, measurement of both quality and efficiency in the context of processes, and process optimization. Furthermore, process optimization entails collection and analysis of both real-time measures (monitoring) and strategic measures (performance management), and their correlation, as the basis for improvement and innovation. Improvement and innovation are expressed in terms of business process creation, process change, and inter-process relationship change, and the determination of which of these to do, *which taken together is itself a business process*. This business change process enables selective closed loop control at the discretion of management initiatives and therefore *business agility*.

The importance of business process emerged over a century ago in the work of Frederick W. Taylor, who eventually published *Principles of Scientific Management*. Well-known for its evangelizing of time and motion studies, it was also perhaps the earliest work that sought to improve business efficiency by identifying certain business processes to which the techniques would be applied. Taylor's methodology was clearly one of the earliest examples of BPR. It also put forth two of the most fundamental and enduring principles of BPM. Contrast the following two principles with the 19th century view (still appallingly pervasive) that every business activity in a business process is executed by a supervisor *commanding* the use of people and other resources:

***The efficient execution of a business process depends on the smooth functioning of a collaborative team.***

***The members of the team (e.g., supervisor and supervised) must have synergistic objectives and work ethics, appropriate skills, and rewards commensurate with contribution, production constraints, and market constraints.***

Peter Drucker's 1954 treatise, "Management by Objectives and Self-Control," laid out the basic principles of management by objective (MBO). Subsequently elaborated by G. S. Odiorne, it clearly built on the lessons of Taylor. MBO is essentially a theory of managerial delegation, providing a framework for defining business functions that can be delegated with a means for determining success or failure of the execution. Peter Drucker's oft repeated maxim that, "you can't manage what you can't measure," is taken to heart by BPM. MBO provides us with the basis for two more BPM principles:

***Every business activity in a business process has a well-defined, detectable set of qualitative and quantitative conditions that determine when that business activity may begin (successfully completes).***

***Every business activity in a business process has a well-defined, detectable set of qualitative and quantitative conditions that determine when that business activity achieves its objectives (successfully completes).***

The very definition of MBO provides the relationship between managerial and delegated business activities. Managerial activities include identifying activities that can be delegated and determining the parameters under which the task should be performed. These parameters include the context or constraints for the task's initiation and execution, resources available for or required by its execution, objectives it must fulfill to be successful, and metrics or measures by which success or failure may be determined. Additionally, determining how delegated activities are *necessarily* interrelated (i.e., what comes before and what comes next) to satisfy higher-level objectives is a key managerial activity. In terms of business process, we can recognize these managerial activities as essential aspects of process definition. In addition, however, some inter-relationships involve managerial discretion determined, for example, by the quality of the delegated activity. Furthermore, in an agile business, even necessary inter-relationships may change periodically and so require that the process definition itself make explicit recognition of managerial discretion.

In terms of BPM, MBO makes it clear that a business process can be decomposed into a *delegation* or *management hierarchy*. Each level of business process description consists of delegated activities interspersed with managerial activities. The process may be partitioned into sets of connected activities that we call a responsibility set. Each responsibility set is defined as being the responsibility of a particular managerial role. In crossing from one responsibility set to another, the responsible managerial role changes, resulting in a handoff of responsibility.

Managerial activities constitute the manager's response to one or more prior activities by authorizing and initiating subsequent activities. A managerial activity forms a decision point (or node) in the business process, determining how to combine the results of prior activities and which subsequent activities will be authorized and initiated. Some decisions are relatively fixed, and so may be captured in advance as rules, procedures, and the like. Others involve judgment and so require interactive decision-making. Either way, decision nodes are the primary managerial control points in the business process short of process redefinition.

If a delegated activity can be decomposed into a set of activities and decisions (which themselves form a process) so that further delegation of responsibilities is permitted, a multi-level delegation hierarchy can be created. This decomposition can proceed consistently through many levels only by satisfying an important principle of BPM:

***Every non-atomic business activity is equivalent to an interconnected set of simplified business activities and decisions (a more detailed business process) to which BPM principles apply.***

Thus, a business process can be understood as a business activity and every non-atomic business activity can be understood as a process involving activities and decisions, thereby enabling the decomposition of a business process into a hierarchy of processes whose responsibility sets conform to the management hierarchy relevant to that process:

***The decomposition of any business process into a hierarchy of processes should conform to the hierarchy of management responsibilities.***

Dr. William Edwards Deming's work raised the bar considerably with a form of business process improvement, which came to be known primarily as total quality management (TQM) and the

predecessor of Six Sigma. Among other things, popular applications of Taylor's and Drucker's work often led to a destructive approach to increasing process efficiency, ignoring quality and timeliness in favor of volumes. Surely neither Taylor nor Drucker would have approved of this effect and would have agreed with Deming that a focus on quality must pervade every aspect of the process. TQM demands that we prevent poor quality and not let it propagate. Quality-related errors should be prevented by good process design, which means identifying what works and what doesn't. We're always able to identify what has occurred in the business process through quality measurements that are meaningful at all levels up the management hierarchy:

***The definition of every business activity includes quality measures defined in a business process context so as to preserve semantic consistency when "rolled-up" along the management hierarchy.***

But quality management is impossible if all we know is how well or how poorly a business activity was performed: It's not enough to recognize symptoms of a problem. We must also have ways of identifying the proximate causes. In process terms, this leads to one or more chains of causes that result from the specific process path taken of all possible alternatives:

***Every alternative means of achieving or failing to achieve the objective of a business process (i.e., all the permissible paths through the process) and the possible causes of error, including reduced quality, are identified.***

This principle forces us to completely define the possible effects of a business process rather than merely that portion that normally achieves the desired objective. It provides us with a way of correlating poor quality and the specific events that have led to it. This doesn't mean we have to complicate the business process definition with all the possible chains of activities and decisions. Instead, it forces a design that enables what software quality engineers call coverage: The process definition takes into account all the possible ranges of ending conditions, given the permissible ranges of starting conditions.

With the work of James Champy and Michael Hammer, BPR was born. Although businesses had obviously been redesigning their processes for decades, Champy and Hammer gave the discipline a fresh motivation, and modern definition, method, and perspective. They insisted that a wholesale redesign and replacement of existing business processes was often necessary. A thorough analysis of the business process as it existed (resulting in the "as-is" model) and a redesign to improve logistical efficiency (resulting in the "to be" model) were required, followed by transition to the new redesign. In the light of (and perhaps despite) inherent difficulties, BPR has often had incredible success, quite possibly a tribute to the great inefficiency of most business processes.

Unfortunately, BPR is a very costly, time-consuming, and disruptive effort for many businesses, especially with respect to precisely those business processes that could most benefit from redesign. Additionally, few businesses have any formal documentation of their business processes and even fewer have accurate documentation, in part because most business processes are dynamic, ever-changing and adapting entities. These facts conspire to make it difficult to capture an accurate, complete snapshot of the business process "as is," so that both the transition plan and the redesign will be moving targets. This increases the risk of an unfavorable result. Even worse, the rules imposed by formal business process models to create provably better redesigns are often too constraining in practice, attempting to force human participants to behave in ways that limit creative response to unforeseen errors and environmental events:

***Although inefficient, existing business processes often include factors that have evolved inductively to maintain robustness and take advantage of local resources.***

In building on both the positive and negative experiences with BPR, BPM focuses on managing existing business processes. It recognizes that business processes and their components don't exist in a vacuum, nor are they typically implemented without subtle side effects and inter-process entanglements due to coupling between objectives, activities, resources, schedules, triggering events, and so on. Control implies considerable (often tacit) knowledge and means for acquiring, maintaining, and applying that knowledge:

***A business must gain control of the relevant portions of a business process and its inter-process dependencies in order to address any optimization goals. This is a knowledge management problem.***

In the final analysis, Hammer (*The Agenda*, 2001) has stated that he "was wrong" about the approach and now recommends a more incremental approach that teases his reader with BPM-related ideas. Research has shown that the BPR approach is often inappropriate, but is valuable in certain processes with high variability. BPM takes a measured approach to the rate at which a process should be changed, since this, too, is a process to be managed and optimized. Recognizing that business drivers and objectives change, perhaps rapidly, it's important to evaluate the cost and benefit of any business process change. An often-overlooked aspect of such evaluation is an estimate of the life expectancy of the change (i.e., before the same aspect of the process needs to be changed again) and the rate of return on that change. By incorporating this analysis, even if informal, high opportunity for return changes will be fostered while low opportunity for return changes will be deferred.

In effect, BPM treats continuous process improvement and BPR as a spectrum determined by the scope of process change. It enables wholesale redesign of a business process when and only when the process environment is sufficiently stable enough to foster a high opportunity for return and the existing process meets certain inefficiency conditions. At the same time, it must be recognized that most process improvement has focused on logistic and operational efficiencies, sometimes focusing on local, functional optimization rather than simultaneous optimization of multiple, strategically essential business processes. It's well-known from systems theory and operations research that such a strategy is counterproductive: The collection of local optimizations is rarely globally optimal and therefore is to the detriment of strategic goals. Thus, local process changes must be subservient to strategic objectives. This is only possible if strategic objectives are consistent:

***Every business process change must be evaluated in terms of its***

***global effects on related business processes, and must provide a positive opportunity for return.***

***The objectives of business processes that are entangled must be mutually consistent.***

Almost all business processes have non-deterministic elements, such as certain built-in latencies used for synchronization and recovery, or those activities improvised by an experienced human participant in resolving exception conditions. These elements are often essential for both global optimization and robustness in the face of a changing business environment. They're the essence of agility. Every business process has a strict ceiling on how efficient it can become without being redefined by changes to its objectives. Therefore, a BPM strategy that focuses on operational and logistic efficiency offers declining returns on the invested optimization effort. By contrast, a business is always faced with new opportunities and threats, reflected as changes to the competitive environment. No matter how often they're addressed, additional opportunities and threats arise. The opportunity for return obtainable by addressing these changes in a timely manner (as contrasted with the potential lost opportunity costs from merely addressing logistical efficiency) is ultimately unbounded:

**BPM refers to a theory or strategy of business management that properly precedes and forms the foundation for a rapidly evolving, extremely valuable technology solution.**

***Business process changes must not sacrifice agility for efficiency.***

The business value of so-called exception processing shouldn't be underestimated. Business people often conceive of an idealized business process as consisting of the ideal set of activities and decisions that result in fulfillment of the process objective. Of course, real business processes often encounter error conditions, some foreseen and some not. There will be activities and sometimes entire processes implemented to resolve these errors. While traditional business process modeling often captures the definition of some of this exception processing, it's almost impossible to capture it all. Traditional business process modeling treats exception processing as triggered by, but distinct from, the business process proper. These omissions have a negative effect on redesign and optimization, and a primary goal of some BPR practitioners is simply the elimination of exception processing.

BPM takes the position that exception processing is inherent within and integral to the definition of every business process, and recognizes that not all exception processing can be given detailed clarification. Under BPM, optimization strives to improve the quality of the business process by minimizing how often exception processing is evoked or, where possible, to convert exception processing into alternative means to achieve the business process objective. Only in this latter case can exception processing cease to be part of the definition of the business process. In general, BPM recognizes that categorizing the most costly errors and associated exception processing is an ongoing, very important task.

The value of exception processing is usually underestimated. While proprietary business processes are, by nature, unique intellectual property and competitive differentiators, the non-proprietary, idealized business processes tend to evolve toward a public definition and don't directly afford competitive differentiation. However, the exception processing associated with non-proprietary business processes is often extremely proprietary and determines the competitive success of the business. Too often, we mistakenly treat the products and services as the subjects of competitive differentiation, but these are merely the result of business processes. As Harvard Business School's Michael Porter would be quick to point out, the competitive differentiation from standard, best practice business process definitions must be optimized and preserved:

***The business sub-processes for exception resolution, together with proprietary business processes, are of critical importance, effectively defining a business's primary competitive differentiation and sustainable advantage.***

### Summary Comments

This brief introduction to BPM should give you some understanding of the approach. Many authors may disagree with this characterization or offer other definitions, but I have yet to find a solid position stated. Following the principles cited here will certainly lead you down the path to BPM. And it starts the dialog so that better recognized writers on management and technology than myself can respond, hopefully, to the benefit of us all.

### Business Process Management Systems

A BPMS is a suite of integrated software facilities designed to enable BPM as defined and described in the previous section. While many vendors have not yet addressed all the issues raised in our current definition of BPM as a business management theory, they're well on the way to doing so. As is often the case in a developing market, which facilities have been developed to support which aspects of BPM is determined by a combination of public perception of critical requirements and the background and available assets of the particular vendor. Indeed, some important vendors in the market don't offer an integrated system, but have focused on delivering sophisticated capabilities for one or two specific BPM facilities or even services.

In this section, we'll examine the vendors and provide a broad description of what they offer. We'll then discuss the key functional elements of a BPMS, and finally turn to the relationships of BPMS technologies to, and the overlap with, business process analysis and modeling (BPA/M), business intelligence (BI), online analytical processing (OLAP), enterprise performance management (EPM), business activity monitoring (BAM), business rules engines (BREs), enterprise event management (EEM), portals, business-to-business (B2B) processes, EAI, enterprise service buses (ESBs), enterprise application servers (EASes) and enterprise platform suites (EPSes), Web Service, and integrated development environment (IDE) technologies.

### Vendor Categories

Vendors offering a BPMS, or as some

prefer, a BPM suite, can be categorized into a few groups. Although not foolproof, knowing which group a vendor belongs to can often provide clues as to how the vendor is likely to think of BPM and address BPMS requirements. Almost all BPMS vendors, however, espouse a technology perspective and so only indirectly address the business management principles BPM represents. This is a rather unfortunate situation since adopting a clearly defined process-oriented business management strategy is essential to a successful implementation of a BPMS (see the article, "BPMS Implementation: Issues and Strategies," in this supplement). However, there are signs this situation is changing.

The eight most prominent categories of BPMS vendors can be easily identified:

- **BPMS pure-play:** BPMS pure-play vendors set out to design a BPMS (or product that's closely related architecturally) from the beginning, and treat this as their flagship product.
- **EAI vendors:** EAI vendors found the addition of process integration and process automation a natural evolution of their software stack. It was then a short conceptual leap to recognize the need for the message flow equivalent of workflow management services and dashboards for activity monitoring and performance management, although many are still evolving to a business process perspective.
- **Workflow vendors:** Much like EAI vendors, vendors of workflow management systems have been able to enter the BPMS market with little effort. A workflow may be thought of as a particularly well-structured business process.
- **BPA and BPR vendors:** Existing business process analysis vendors gained much of their market through the interest in BPR. These vendors often have considerable process analysis, definition, and simulation experience, and some have extended their product offerings to include process execution and monitoring capabilities.
- **EAS and IDE vendors:** These vendors increasingly find migration to the BPM market attractive. The first step usually involves adding graphical rules-driven or process-driven capabilities and integration (especially for Web Services and Enterprise JavaBeans) to the IDE, enabling rapid development of process-based applications. Moving beyond this technical process view requires adding business process analysis and design, and a true process engine driven by process definitions that can work externally.
- **Enterprise application vendors:** Enterprise applications suites (e.g., ERP) have included both embedded workflow management and some EAI capabilities in their products to enable customization and integration. With recent market pressures, they've begun to expose the functionality of these facilities and to enhance and redeploy them, increasingly satisfying the requirements of a BPMS.
- **BRE, BAM, and EEM vendors:** Products from these vendors play a significant role in a BPMS. Some are extending their products to provide more complete BPMS functionality. A few vendors have used rules engines to implement a rules-driven approach to process execution. (In other articles in the BPM supplement, the relationship of BPMS to BAM and EPM is discussed.)
- **BI and OLAP vendors:** These vendors are emerging as BPMS vendors in the context of business, corporate, or EPM and dashboards for this purpose. They're beginning to recognize that support for BPM or workflow management is necessary functionality in meeting performance management requirements. They can be expected to expand support for process beyond analytical flows.

## BPMS Facilities

It's next to impossible to describe all the ways in which vendors have attempted to implement a BPMS. For this reason, we'll concentrate on describing the components of an idealized BPMS as represented in the accompanying poster, The 2004 BPMS Reference Architecture. Conceptually, these components can be understood as belonging to six groups. In summary, these are:

- User interfaces
- BPA/M facilities
- Run-time components
- BAM and EPM
- Infrastructure
- System management.

In the following, neither system management nor the user interfaces (i.e., B2B portals, process administration, process monitoring, workflow clients, business process and activity monitor, EPM dashboards, and business activity monitoring dashboards) are described. Their function should be obvious.

## BPA/M Facilities

A BPMS incorporates a suite of BPA/M tools, shown at the far left of the 2004 BPMS Reference Architecture. These are the facilities by which users of a BPMS, rather than those who must support its use, interact with the system. They should be seamlessly integrated so the business user can move between them without losing context. The definitions produced via these facilities are stored in a repository, where they may be accessed either directly or indirectly by the run-time system.

- **Business process modeler:** The business process modeling tool is the primary process design and change interface to the BPMS. In addition to the traditional business process analysis (BPA) functionality of capturing, designing, and modifying business processes and their properties, the operational and interface properties of the business functions with which they interact need to be addressed. These include resource requirements. Although some process design methodology will undoubtedly be assumed, the modeler shouldn't impose restrictions during the capture of a process, either in terms of complexity or structure. It should permit users to define and selectively enforce process standards, and provide help in developing a transition plan between process designs. Various views of a process should be possible, depending on authorization, functional responsibility, and level of detail desired. This last requirement is crucial if process independence and process abstraction are to be supported.
- **IT orchestration modeler/mapper:** The IT orchestration modeler is used to define and maintain technical flows such as message and data flows, data transformations, transaction management of IT resources, and so on. It's this tool that's used with a process-driven IDE as may be found, for example, in an application server or application platform suite product. In an ideal BPMS, it supports mapping between business process definitions and technical orchestrations. In addition, business functions are mapped to service classes. This may be done either explicitly or implicitly (by defining the resource capabilities that can then be automatically mapped to resource requirements).
- **Business transaction modeler:** The ability to relate business transactions to business process events and to specify

transactional properties is important to a business, even if business personnel don't use the technical language of transaction processing. The business transaction modeling component provides the ability to capture and maintain business requirements for audit, consistency, and error recovery (whether traditional rollback, compensation, exception processing, or some other technique).

- **Technical transaction modeler/mapper:** A business transaction must ultimately be translated into an implementation model that maps it to a coordinated collection of flows, events, and defined technical transactions with various atomicity, consistency, isolation, and durability (ACID) properties. This tool is used to create those definitions and mappings, and maintain them.
- **Business metrics modeler:** Business processes and business functions are of little value to business managers unless they can be associated with business metrics or key performance indicators (KPIs). The ability to capture the definition of familiar business metrics and relate these computationally to raw measurements (as produced, for example, by the process engine or particular business functions) is therefore essential in a BPMS. The distinction between business metrics and raw measurements is essential. For example, expected time-to-completion of a business transaction is of business interest, whereas mean queue times, mean activity service times, and most probable path to completion are too technical and detailed. Business metrics definitions have an impact on which raw measurements are made and how long they're kept.
- **Technical measures modeler/mapper:** A business metric or KPI must ultimately be translated into a set of physical or technical measures and the operations used to obtain those measures. This tool is used to specify the technical measures required and the methods by which business metrics are derived from them, and to maintain those specifications.
- **Business process simulation and animation:** Discrete business process simulation is an invaluable aid in the design, optimization, and troubleshooting of business processes. It should permit altering the distribution of alternate paths, adjusting costs for activity-based costing (ABC) analysis, and the distribution of data values that control process path branching and merging. Visual highlighting of potential bottlenecks or inconsistencies, and identification of best-of-alternate process designs according to user-specified criteria are extremely valuable capabilities of a simulator. It should be possible to drive a simulation from user- entered, generated, or historical data. Visual presentation of a simulation as it progresses (a.k.a. animation) and of simulation results are highly desirable.
- **Simulation engine:** Simulation validity depends on accurately representing the operational characteristics of the process engine. The more finely tuned to match the target process engine and the typical mix of processes it runs, the more accurate and meaningful the results are likely to be.
- **Dashboards:** Facilities to monitor process instances (in-progress business processes) and the metrics they produce are needed by business managers and technical and system administrators. On the poster, we show three types of such dashboards: BAM Dashboard, EPM Dashboard, and Process Monitor Dashboard.
- **Dashboard designer:** Dashboards may need to be designed for a wide variety of specific user roles. The facility may make advantageous use of personalization and content management technologies.
- **Business process administrator:** Authorized users need to be able to start, stop, pause, redefine, or alter a process or business function instance. They may also need to modify (i.e., repair) a message (including production or control data), or may need to manually assign or reassign resources. The ability to perform these functions on a live process instance is one measure of the agility a BPMS is likely to provide.
- **Business analyzer and report generator:** Many of the questions that business personnel seek to answer require considerable computation and analysis. Sometimes, the analysis involves complex statistical or other mathematical models that the user need not know, but only wishes to use. Report generation (often with sophisticated graphs) is needed to view the analysis, preferably with Web distribution. These facilities are common in OLAP systems, although the business analyzer component of a BPMS should be customized for use in a business process environment. Libraries of preprogrammed analytics and wizards for understanding particular business processes would be a valuable addition. These facilities are often considered components of a BAM and EPM product.

### Run-Time Components

The run-time components are the heart of the BPMS. Without these, a BPMS cannot execute a process definition or enable the management of individual runs of the process (i.e., process instances). The technical architecture, features, and functions of these components largely determine operational availability, performance, efficiency, and flexibility.

- **Process engine:** The BPM process engine is clearly the central component of a BPMS, without which it would be, at most, a planning or documentation tool. Its purpose is to implement a business process, managing the real-time invocation (or activation) and termination (or completion) of business functions. Ideally, it won't dictate the form of those processes or the nature of the business functions (although it should certainly encourage standards and good design). Note that we show a traditional workflow engine as being a subset of an ideal BPM process engine, indicating that it should be able to handle structured workflows and more.
- **Distributed BPM coordinator:** For B2B, business-to-consumer (B2C), global, cross-division, or multidepartment business processes, a federated or distributed process engine is required. This has obvious implications for process engine capabilities regarding remote process invocation, communication, and coordination. In some cases, process engine-to-process engine conversations are coordinated by a so-called public or global process, or by a collaboration. Each conversant in the conversation (there may be many, for example, in a trading hub) may have an independent, preferred view of the process and distinct security policies, possibly seeing the external portion of the process as a subprocess. The coordinator is simultaneously a kind of supervisor and a firewall.
- **Resource manager:** In an ideal BPMS, a general facility is needed to enable independence between business function definition and its implementation. It's this resource independence that enables business users to focus on business objectives as a first priority, improves robustness of the business

process definition, and enables efficient, run-time management of the available resources. Business functions may be implemented by mechanical, electronic, software, or manual means. The resource manager must select a specific resource with the capabilities that match definitional and run-time requirements, and then orchestrate the execution of the requested business function. The resource must be available at the time the business function is invoked or activated, and be returned to the pool of available resources when the function is inactive, completes, or terminates. Often, a task can be parallelized and load balanced across a set of available resources at execution time. If a preferred resource is unavailable, the resource manager should automatically select an alternative. For example, a task that's performed ideally by automated means may have to be performed by manual means.

- **Scheduler:** The scheduling of business functions is an important task within a BPMS. Were unlimited resources available, were there no timing dependencies, and were there no external constraints, business functions could be executed as soon as any preceding business functions complete. However, these conditions are rarely the case. Authorizations, loads, and capabilities must be considered, and some functions are performed by agents over which we have no control. Additionally, business processes and transactions often have externally imposed timing constraints or are triggered by external events. These factors make the scheduling of business functions a complex technical problem, similar to job shop scheduling. A BPMS without such a component won't perform efficiently, nor will processes be performed in a timely manner.
- **Rules engine:** A rules engine can augment both the process engine and the resource manager. One method of representing a process's permissible transitions, and therefore the decisions that control flow between activities, is as rules. Activity initialization and completion conditions can also be represented as rules. Matching of resource requirements for a business function to the capabilities of a class of resource can be accomplished in a flexible manner with a rules engine. The rules engine can help the resource manager optimize resource assignment, although performance is sometimes critical. Note, also, that a rules engine plays an important role in BAM and EPM, especially relating events, metrics, and responses.
- **Hardware interface manager:** This facility enables a BPMS to support activities involving the control of machines using computerized numerical control (CNC), robotics interfaces, process control interfaces, and so on, in a business process. This enables the operation of loading cranes, canal locks, manufacturing equipment, valves, and much more.
- **Interface manager:** A BPMS is of little value if the process engine cannot communicate with business functions as implemented. It must be able to communicate both control flow and data flow in a coordinated fashion, though these may be separately defined and quite distinct. (This is far from trivial. Few interfaces are designed for anything other than data flow!) If the BPMS is integrated with a suite of integration components, it's this BPMS component that's responsible for the operational aspects of that integration. Communication with transports, adapters (whether to middleware, applications, or presentation software) and technical orchestration engines is handled by the interface manager.
- **Worklist manager:** Interacting with human resources requires some method of task delivery. Either a push or a pull method may be used. Traditionally, human-oriented workflow management has required logged-in users to select tasks from a list of those awaiting execution. Lists are often prioritized, with escalation as necessary to meet expected or required schedules. Today, task selection may invoke an automatically generated applet or form, or perhaps an interactive function within an enterprise application. Support for manual activities that involve external resources (either disconnected software systems or mechanical operations) should be provided.
- **Repository:** A BPMS requires a sophisticated DBMS or repository for data and metadata. There are many data objects that the repository must store, including business process definitions, integrity rules, instance histories, messages and data flows, business metric definitions and data, business analytic and report definitions, along with saved data, transaction definition and data, security and policy definitions, access histories, simulation data, error events and resolutions, and so on. Although the repository appears in two places on the 2004 BPMS Reference Architecture, a single virtual repository consisting of an arbitrary number of physical (but necessarily semantically consistent) repositories is intended.

These technical, run-time components, if not properly integrated, would be a daunting collection to use and manage. But if bound together internally with a common architecture and set of programming interfaces, they form a cohesive, collaborative unit that can be used to enhance the integrity of an enterprise.

### Business Activity Monitoring and Enterprise Performance Management

The ability to monitor events, analyze measurement data, detect trends, and compute KPIs is essential to the concept of process management. Without them, there's no ability to intelligently optimize business processes or to create effective new business processes in response to strategic events. These facilities are shown on the far right of the 2004 BPMS Reference Architecture. The semantic layer, analytics engine, and rules engine are common to both BAM (which focuses on detection and response to real-time events) and EPM (which focuses on detection, response, and prediction of trends relating to business performance).

- **Semantic layer:** This layer handles the mapping between views expected by business users, on the one hand, and technical descriptions and references on the other. This is a conceptual layer that permits business users to monitor business processes in terms of business metrics, business objects, balanced scorecards, and other familiar business objects.
- **BI/analytics engine:** The execution of complex packaged, rules-driven, or scripted analytics is often necessary for the computation of business metrics and KPIs from low-level or technical measures.
- **Portal management and personalization:** Every business user is likely to require personalized presentation of business metrics. This can be accomplished through portal management when dashboards are deployed as portals.
- **Event management:** BAM requires the ability to detect both business and technical events, interact with a rules engine

and an analytics engine to classify the event and determine an appropriate response, and ultimately to execute the response. Response execution may involve initiation of processes, raise events, triggering alerts, and so on.

- **Enterprise information integration:** EPM and BAM require access to a wide variety of data sources. Conceptually, this is the function of an enterprise information integration (EII) product, although most BPMS products (and stand-alone BAM and EPM products) will provide integrated access to a limited number of data sources.
- **Content management:** Most business data is embedded in documents. The incorporation of content management functionality within a BAM facility enables the detection of a broader spectrum of data events.

### Infrastructure

The following technology interfaces can be either simple or sophisticated, but some version of them must exist if the BPMS is functional. Note that the audit, error, security, and policy facilities are grouped together on the poster.

- **System manager:** A BPMS requires an IT support facility for installation, configuration, and system management. The system manager should have all the usual desirable properties of an enterprise-class software system manager or administration component. A system administrator's job is difficult enough without adding complexity here, so usability and reliability are paramount. The goal is the elimination of manual administrative tasks, "error-proofing," and online guidance.
- **Audit facility:** The ability to audit a business process is a common business requirement and indispensable in most businesses. The audit manager keeps track of what was done and what decisions were made, when, by whom, and with what resources. Audit conditions, once defined, shouldn't be circumventable. Audit points are closely associated with, and ideally should be defined by, business transaction boundaries. Audit trail querying and report generation must be supported.
- **Error facility:** Although many errors can be anticipated and business processes established to handle them, there will always be unanticipated errors. These must be managed in a consistent, auditable fashion, even if the handling is manual and ad hoc. A guided facility to define classes of error and associated responses is desirable.
- **Security and policy facility:** As noted earlier, not all agents are authorized to perform every task or activity, to use any resource at any time, or to use any amount of a resource. A BPMS must not violate these business policies, and must enforce security. It may be necessary to support encryption, digital signatures, public key infrastructure (PKI), biometrics, and the like, as well as single sign-on, non-repudiation, and so on. The BPMS must have a security model with respect to its access, use, and administration, as business processes may represent the crown jewels of a business's intellectual property.
- **Integration infrastructure:** At one end of the spectrum, integration infrastructure consists of a set of direct-connect adapters that provide point-to-point integration between the BPMS and means used to implement business functions or activities. At a minimum, a BPMS requires a way to communicate with people for manually implemented business functions, and there are certainly many business needs that a simple BPMS with one such application or middleware adapter could address. At the other end of the spectrum, integration infrastructure may be a full suite of business integration components. Clearly, a BPMS best operates in the context of a complete integration layer. This may be a traditional EAI stack, Web services over an ESB or a variety of other architectures, and is shown along the bottom of the 2004 BPMS Reference Architecture.
- **IDE:** As BPMS usage matures, users will undoubtedly want to develop applications that take best advantage of BPMS capabilities. To this end, a suite of development tools is needed. In its simplest form, such an IDE enables the development of new adapters and Web services that are process-aware. An IDE for process-driven design and development of process-enabled, event-driven, and rule-based applications or application components is highly desirable. An integrated process-object methodology should be learned before such tools are used. A process-driven IDE is sometimes provided within application server and application platform suite products.

### Conclusions

Today's BPMS products have progressed from simple workflow-like capabilities with minimal support for BPA/M and BAM a few years ago to support for more complex processes with both manual and automated activities. BPA/M support has greatly improved, and both BAM and EPM support are progressing. All this is highly encouraging.

Nonetheless, we have several improvements to look forward to in the coming four or five years. The following are particularly important:

- A broader range of business processes with less need to translate them into highly structured equivalents
- Separation between business views and technology-dependent views in design and monitoring
- An integrated approach to exception processing and resolution
- Improved federated and distributed capabilities for better enterprisewide and B2B support
- Collaborative business processes
- Coupled (a.k.a. entangled) business processes
- Robust business transaction support
- Intelligent resource managers and better resource independence
- Proven, standardized design and development methodologies
- Detailed implementation methodologies
- Integrated BAM/EPM with closed-loop optimization
- Higher levels of performance, reliability, and availability
- Libraries of standard, but easily customizable business process definitions (templates).

The vision and promise of BPM and its related technologies, as realized in a BPMS, is an exciting proposition with many potential business benefits. However, as with strong commitment to any enterprise strategy and technology, adoption should be a studied, measured activity, demanding appropriate incremental return for incremental investment. That spells BPM success. **bij**

## About the Author

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The business process management (BPM) market has tendrils that stretch decades into the past with process manufacturing and control systems, workflow management, application integration, business process re-engineering (BPR), and so on. However, it didn't become a widely recognized acronym until the late 1990s. As Michael Hammer, the father of BPR, points out, " . . . the term [BPM] had no meaning in the past." As a technology, BPM generally referred to business process modeling, although a few used BPM as an undefined extension of business process re-engineering.

With the advent of sophisticated process engines and EAI infrastructure in the late 1990s, the concepts of managing the entire life cycle of a business process through technology and of managing a business in terms of its business processes finally became viable. By all accounts, industry analysts began tracking what we know today as the BPM market (BPM products and services) around 2000. Predecessor categories to BPM, including business process re-engineering, workflow management, and document management, were tracked previously from the early 1990s. During the last five years, BPM has matured both as a market and as a category of products and services.

# The BPM Market:

Analyst definitions of BPM technology are now in reasonably close agreement, but their definitions of what should be included in sizing the market vary tremendously. For example, when evaluating the market contribution of EAI vendors with a BPM offering, some analysts include revenues generated from integration services. How much of this revenue is accrued to the BPM market depends on how encompassing you consider BPM to be, and whether it's distinct from EAI, business process integration, and the like.

From the pure EAI perspective, BPM is a class of middleware used to accomplish business process automation and business process integration, and so is indistinct from EAI. When one considers the fact that Web services are playing an ever increasing role in integration, and that Web services orchestration can be understood as a particular approach to process-centric integration, one is faced with the question as to whether EAI encompasses BPM, BPM encompasses EAI, or is it completely distinct. Similar problems arise with respect to the markets for CRM, supply chain management, compliance management, business process outsourcing, and document management. All these are highly responsive application areas for BPM, so much so that BPM may subsume them in the same sense that the enterprise software market subsumes ERP. If these relationships are taken seriously, the BPM market opportunity going forward is in the high tens or even low hundreds of billions in U.S. dollars.

# Past, Present, & Future

Some analysts perceive BPM as having little to do with application integration except for a strong synergy. BPM enables focused, business-driven application integration and an integration infrastructure enables BPM. Other analysts focus on the fact that a business process management system (BPMS) can be understood as a natural, though perhaps significant and even disruptive, evolution of workflow management systems (WfMSes). Still others view BPM as a revitalization of the business process re-engineering and process change markets enabled by e-business and the growth of EAI (and especially process-centric integration) technology and standards.

The important message is that BPM consumers must understand BPM market assessments and forecast in the context of the analyst's perspective. Regardless, it's almost universally agreed that the BPM market opportunity is very high, that its compound annual growth rate (unrestrained by a bad economy) is among the highest for any software category, and that the potential ROI and rate of return has few peers. In 2000, most estimates of the BPM market were in the tens or perhaps low hundreds of millions in U.S. dollars. By some analyst forecasts, the BPM market will be between $4 and $6 billion U.S. dollars in 2005.

## By David McGoveran

To take the pulse of the current BPM market, *Business Integration Journal* invited key industry analysts to answer a few questions. *Business Integration Journal* is grateful to Jim Sinur of Gartner, Ian Charlesworth of Butler Group, Nathaniel Palmer of the Delphi Group, Hollis Bischoff of META Group, and Ken Vollmer of Forrester, for participating. Their interviews are summarized here.

# Gartner on the BPM Market

Jim Sinur
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Gartner has been tracking the workflow market since the mid-90s, and changed the practice to BPM in 2000. They define BPM as the management of business processes, end-to-end, regardless of what's included. The technology enables end-to-end processing of business events, including managing the necessary resources.

Gartner divides the market into visual/administrative BPM, collaborative BPM, application-specific or preconfigured BPM, integration-focused BPM, and pure-play BPM. So far, Gartner has focused on tracking the pure-play and integration-focused BPM vendors, defining pure-play as vendors of technology that links processes together.

Sinur says that the pure-play BPM market (of which there are about 95 vendors) was about $455 million for new license revenues and the overall pure-play BPM market was about $1.2 billion. While Gartner hasn't released numbers for 2003 (the report is due in May), Sinur expects these numbers to have grown by about 20 percent. For 2006, they are forecasting $3 billion for tools and $6 billion for solution providers around those tools. Compliance issues are among the primary drivers of the market.

The return on relationship (ROR) from BPM projects for the next five years is estimated conservatively at 10 to 15 percent on average. However, says Sinur, the ROR for projects that go after the "low-hanging fruit" with obvious cost-cutting benefits is closer to 20 to 30 percent. Examples of processes that fit in this category include mortgage underwriting, pharmaceutical drug certification, customer service, and CRM functions. Informally or manually managed business processes tend to develop as much as 50 percent exception processing as process entropy (a.k.a. process decay) kicks in. Gaining control over exception processing is an obvious problem to attack with BPM.

So far, Gartner thinks that about 40 percent of the current market has been penetrated, but the opportunity going forward is enormous. There are about 110 vendors total in BPM and all are making money, so it's pretty clear that the market hasn't reached 100 percent penetration. There's been some consolidation, but not nearly as much as was expected during 2002 to 2003.

The early adopters of BPM were big: insurance, banks, healthcare (due to HIPAA), and government. Medium-size companies (revenues in the hundreds of millions of dollars) are now adopting, which is pulling some additional players into the market, with some indications that even smaller firms are starting to take notice. The verticals seeing the greatest benefit, in order, are insurance, government, healthcare, discrete manufacturing, and telecommunications. The big surprise, says Sinur, is retail.

Gartner predicts that the BPM market will see increased selling of business process templates. There will be three main types of templates: vertical process, horizontal process, and compliance templates. BPM is at the heart of the buy-vs.-build argument because it offers a solution that's a huge blending of the two: where maybe 50 percent of functionality of an application is BPM. Sinur also predicts that the markets he calls "the Killer B's" (BPM, business rules, BAM, and business process analysis) are converging.

**Gartner offers two services that pertain to BPM, their integration service and the application development service.**

Sinur says that workflow "failed" the first time around because it was highly departmental, had no design support, no methodology, and weak performance. Although BPM has begun to address the other issues, he sees its biggest hurdle is the lack of a publicly accepted methodology. The difficult part of BPM is the link to integration. Sinur believes integration is moving toward a commodity market, so that pure-play BPM vendors must have an integration partner.

Gartner offers two services that pertain to BPM, their integration service and the application development service. They also address BPM out of vertical services. In addition, they offer market watch and consulting services for BPM. Both BPM pure-play and EAI vendors rate a "magic quadrant" study comparing the top 50 vendors in each segment. Several Gartner Reports on BPM are available, including "Drivers for BPM: 11 Money-Related Reasons to Start," published Feb. 25, 2004. **bij**

# Butler Group on the BPM Market

Ian Charlesworth
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Butler Group's first report on the BPM market was published in March 2002. They define BPM as concerning "the software and tools required to model and execute an organization's business processes, through the orchestration and integration of the necessary people, systems, applications, and application components." That market includes the process modeling environment, development environment, process testing and simulation, process engine, rules engine, process management suite, administration tools, repository, integration layer, and presentation layer.

According to Charlesworth, BPM technology was "first generation" from 2000 until 2002 and is now in its second generation and growing rapidly, though still in the early adopter phase of the category life cycle. Initially, EAI vendors drove the market, enabling rapid adoption of BPM and letting business users see IT assets as business process-related. BPM can be understood from the business process model and management view by business users and simultaneously enable IT users to understand the real assets that implement process activities as services. This is the first time such a strong synergy and mapping between IT and business has existed. With early successes, the danger is now that vendors will oversell BPM. He advises a focus on vertical solutions so that both investments can be controlled and benefits measured. Ian expects BPM to move to market adoption within two to three years and to reach maturity in four to five years.

Butler Group says that global organizations with complex processes are the primary adopters, with manufacturing, telecommunications, and financial services seeing the greatest benefit. He cautions that, against a backdrop of dramatic, attention-grabbing vendor claims relating to potential ROI and benefits, BPM needs to be critically challenged in terms of discovering exactly how and where it will add value to the business. Solutions need to be focused on business problems (compliance, distributed order management, etc.) if positive ROI is to be realized.

As Web services and service-oriented architecture (SOA) take hold, the task of application integration will be drastically simplified. This will create a level integration playing field, which will ensure that BPM offerings truly compete at a business level. In broad terms, we're talking about creating points of integration between BPM and related technologies, specifically business intelligence (BI), corporate performance management (CPM), and more importantly, workgroup and enterprise collaboration.

The greatest barrier to BPM adoption is seeing BPM " . . . as purely a technology solution. BPM needs to be seen as a mover of power from IT to business units and so it's important to look at the organization's strategy first. BPM users should identify business problems, and only then try to discover the IT source or solution. The technical solution is incidental. BPM encourages this approach."

Vendors were selling BPM as an IT solution with a business management facility on top, but are now understanding that the business drivers are first. They're still feeling out business issues surrounding BPM adoption and organizational change; business consultants and systems integrators (SIs) will now come and deal with this.

In successfully adopting BPM, significant change management is required; this consumes 75 percent of the effort.

In successfully adopting BPM, significant change management is required; this consumes 75 percent of the effort. Because processes are intertwined, businesses need to understand process change implications, purpose, and value. Making changes is complex and requires both short-term and long-term impact analysis. The technology comes in for only the last 25 percent.

Butler Group's Ian Charlesworth is one of the principal authors of *Business Process Management–A Guide to Navigating the Process Minefield*, published in February 2004. They also publish the Butler Group *Technology Evaluation and Comparison Report*, and provide research and analyst consulting services. **bij**

# Delphi Group on the BPM Market

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Delphi Group published its first BPM report in 2001. They define a BPM system "... by the components of an execution engine, process designer, process definitions, an activity monitor, and user interface." A BPM system must include process extraction, definition, and execution; be transparent with respect to human vs. automated tasks, provide an identifiable and independent process definition (not merely an application generated from a process definition), separate integration logic from process execution logic, provide introspection of the integration layer so that the interface isn't hard-wired or use purely manual data structure mapping.

Delphi characterizes the BPM market based on the results of a survey. Their 2003 survey respondents spent $550 million on BPM projects, of which 26 percent was software and 39 percent was integration services. The BPM software-only market was estimated at $500 million, suggesting that the overall market was something less than $1.5 billion. The market is expected to grow at 15 to 30 percent annually over the next three years.

Initial projects tend to be implemented with considerable help from external services, but the trend is to bring this expertise in-house. Almost 90 percent of survey respondents cited BPM projects as having a positive return or at least netting out expenses. Case studies report ROI in as little as the first four months after deployment.

The market has a long way to go. It has been strong through the present by applying BPM to the "low-hanging fruit": — namely, those situations in which an obvious process improvement could be obtained through BPM. The "leap of faith investments" are over and the market is moving to solution selling. Still, Palmer states that less than 5 percent of the market opportunity has been addressed.

Businesses that can benefit from current BPM technology must be of significant size. There's more adoption among midsize businesses than elsewhere. Adoption isn't being driven by IT, but usually by a group with a business transformation charter such as an e-business group. Telecommunications, finance, and insurance are seeing the greatest benefits. BPM technology is driving (i.e., enabling) business change rather than the other way around.

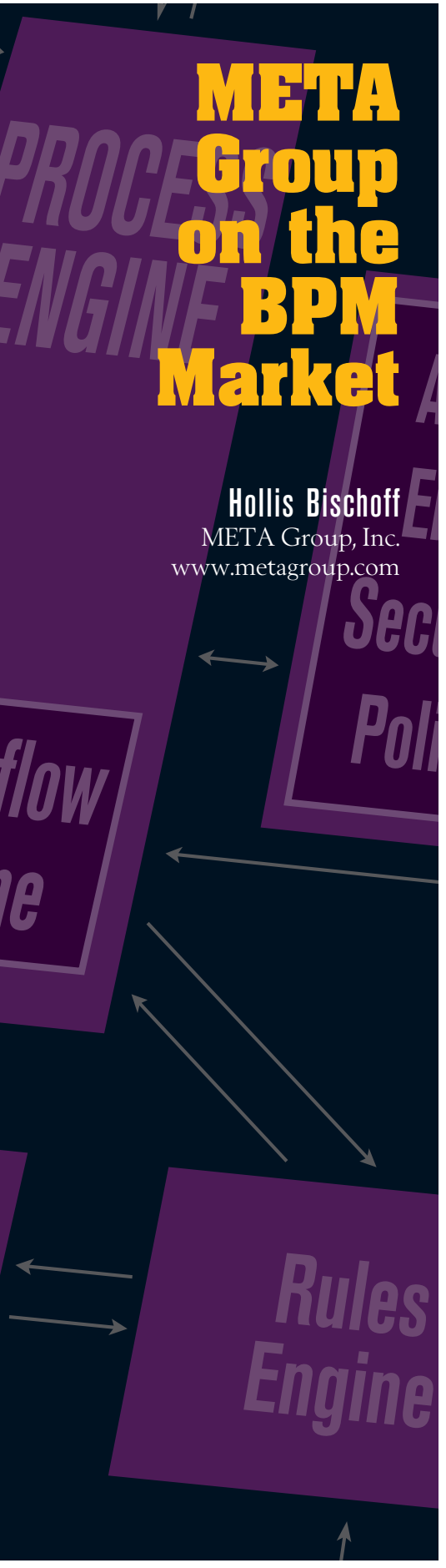
Palmer predicts that BPM will see heavy use in business process outsourcing (BPO), not just for cost-cutting, but to handle capacity variability. BPM will enable business knowledge capture and transfer, so that education about a specific task can be rolled up and delivered to a generalist for execution. It will be used increasingly to help bring new personnel and new business units online quickly. The trend is toward frameworks on platforms, most of which are Java 2 Enterprise Edition (J2EE).

In 2004, modeling facilities will improve. Federated and cross-process security support will come. BPM will begin to leverage presence technologies (e.g., instant messaging) for more robust, adaptable task assignment by delivering the task to the human resource. This will eliminate the need for a person assigned a dedicated role to attend to a worklist manager.

BPM technology is unique in that it must not be separated from business issues. It's difficult for businesses to learn to think in terms of process; this can take nine to 12 months or longer. The biggest barrier to adoption is for the business to become adept at process discovery and capture. Rapid improvements in products can be expected in support of these difficult tasks.

BPM technology is unique in that it must not be separated from business issues. It's difficult for businesses to learn to think in terms of process; this can take nine to 12 months or longer.

Delphi Group published the BPM *2003 Milestone Report*, and the first report of several expected in 2004 will appear in May. The firm provides several BPM-related client services, including executive workshops, process redesign, a framework for market analysis, and how to write requests for proposals. **bij**




# META Group on the BPM Market

Hollis Bischoff
META Group, Inc.
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META Group started tracking BPM in 2002, but Bischoff states that they had tracked the same market for many years before as workflow. Says Bishcoff, "BPM refers to both a concept and technology (just like CRM). The concept provides for establishing goals, strategies and objectives for improving particular operational processes having significant impact on corporate performance. BPM technology automates and manages business processes by tracking and coordinating the flow of work and information across all human and system interactions. Some BPM vendors offer analytics and simulation tools to get to the most optimized process."

They define the BPM market as including only those vendors offering process modeling, process orchestration engine, integration server, process monitoring and analysis, and process simulation and optimization in their technology. META Group declined to size the market or state a typical ROI or ROR. However, Bischoff did say that BPM vendors so far have penetrated less than 10 percent of the market, which "has great growth potential."

According to META Group, most organizations of any size are adopting BPM for a single process or departmental effort. There are few organizations of any size adopting BPM as an enterprisewide standard for all processes. Those with the most significant manual processes (e.g., financial services and healthcare) are seeing the greatest benefit.

Bischoff predicts that applications, EAI, Web Services, collaboration and BPM will come together as a set of tools that can create, manage, and measure collaborative applications or services. She emphasized that the greatest barrier to BPM adoption was " . . . cultural acceptance of standardized processes across humans, [and] the acknowledgement that a single individual or department should be sub-optimized in order to optimize the entire process or enterprise." People have to be taught the value of giving up some control over their work habits and of performing business functions in a repetitive manner.

Bischoff believes that the current state of BPM technology primarily addresses manual processes (a.k.a. workflow), with simultaneous support for the combination of manual and automatic activities by any process engine on the market as being too difficult.

She believes that the current state of BPM technology primarily addresses manual processes (a.k.a. workflow), with simultaneous support for the combination of manual and automatic activities by any process engine on the market as being too difficult. In META Group's view, BPM is just the latest step in the evolution of workflow and is nothing new.

META Group offers a BPM research service, as well as consulting. An important product coming later this year is a BPM METASpectrum. **bij**

# Forrester Research on the BPM Market

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Forrester/Giga began tracking BPM about 2000, covering some pure-play and EAI vendors. Vollmer defines BPM as the designing, executing, and optimizing of cross-functional business activities that incorporate people, processes, and functions. Forrester divides the BPM market into several segments of vendors: pure-play, EAI, platform vendors, enterprise applications, and enterprise content management.

Forrester estimates that the market in 2000 was less than $10 million (U.S.). In 2002, it had risen to about $50 million. By 2004, it's about $1 billion in software and services, of which about $300 million is software. "By 2006, we expect it to double."

similar to electronic data interchange (EDI). The sectors that have seen the greatest benefit so far are banking, insurance and retail, but it's clear that there's a big potential in manufacturing.

Most large organizations will adopt a BPM agenda within the next five years. BPM requires significant organizational realignment as businesses become more process-focused. BPM eliminates functional department boundaries and puts pressure on jobs.

Vollmer says, " . . . the greatest barrier to BPM is the adoption drag effect." Effective sharing of information among related departments or other entities is highly dependent on the use of common technology and interfaces. Therefore,

Less than 20 percent of companies have adopted BPM technology and most of these have revenues of greater than $1 billion. The midsize market has barely been touched.

"The worst mistake you can make is to pick a good BPMS and then waste the investment on something easy, something low risk and therefore with no payback," warns Vollmer. Most organizations will have about a one-year payback period on their first project, due to the steep learning curve. By the second project, return is realized in 60 to 90 days, and continues to go down with subsequent projects.

Less than 20 percent of companies have adopted BPM technology and most of these have revenues of greater than $1 billion. The midsize market has barely been touched. Forrester thinks that this market is following a maturation pattern

any adoption of BPM would still find it difficult to deploy across its entire value chain, as it's unlikely that all the participants in an enterprise process would universally adopt this capability.

Forrester offers guidance on and a framework for vendor selection, request for information preparation, and analysis of responses on a client subscription and consulting basis. Online, the company offers interactive Tech Rankings so clients can compare two vendors. This is available now for the pure-play segment. Tech Rankings for EAI vendors of BPM technology will be available later this year. A new *Forrester Wave* report evaluating competitors is in preparation. **bij**

# STANDARDS AND BPM

By Ismael Ghalimi & David McGoveran

Almost by definition, every type of enterprise software requires standards to enhance interoperability. Business process management systems (BPMSes) certainly deserve to be classified as enterprise software and there are many opportunities to use standards with them. The two main uses for business process management (BPM) standards are multi-system interoperability and component interoperability. Both preserve software investments. Perhaps more important, however, is preserving business process knowledge in reusable form.

Standards developed for other process-related purposes are often useful for BPM technology and practices. Some standards that relate to BPM, such as Unified Modeling Language (UML), were developed with an entirely different objective. Some standards, such as IDEF0, were in place long before the conception of the first BPMS. BPM's heritage in business process analysis, business process automation, business process re-engineering, and workflow have led to the adoption of existing standards used in those disciplines. In addition, the use of newer technologies, such as Web Services in BPM technologies, has initiated the evolution of older standards and development of new ones.

The standards that are, or would be, useful to BPM can be classified according to their function (see Figure 1).

Much remains to be accomplished when it comes to BPM-related standards. Standards don't yet exist for all these functions and not all standards define an application programming interface (API). Additionally, numerous de jure and de facto standards groups exist with overlapping objectives. These groups sometimes represent disparate perspectives and a common approach to BPM-related standards is far from being established. For example, automated activities might be invoked using an asynchronous messaging protocol, a synchronous API, or Web Services protocol. Each would require a different approach to choreography and orchestration.

Process specification or execution languages that have a workflow heritage generally approach the problem top down, from a process enactment or control perspective. They usually provide support for activities performed by humans, along with resource assignment, functional roles, and organizational units. By contrast, those languages with a service-oriented architecture (SOA) or Web Services heritage generally approach the problem bottom up, with services collaborating or interacting in an orchestrated or choreographed manner to create the business process. These differences can have a profound impact on functionality, business vs. IT value proposition, and ease of use for the business user.

The story has just begun. We can expect extensive development of BPM standards over the next five years as the definition and value of both BPM and BPMS products continue to mature. For now, we can provide only a brief guide to the more relevant standards, most of which are still being developed:

The Business Process Execution Language (BPEL) offers an execution language for distributed and transactional business processes based on the Pi-Calculus mathematical model. It supports the orchestration of multiple independent but communicating processes. It relies on the standards-based Web services stack for process-to-process communication and integration with third-party systems. Version 1.2 of BPEL for Web services (BPEL4WS) will be released soon and will offer support for distributed transactions based on contributions made by Intalio to the Organization for the Advancement of Structured Information Standards (OASIS) WS-BPEL Technical Committee.

The Business Process Modeling Language (BPML) was the first standards-based business process modeling language for executable processes and has been developed by the Business Process Management Initiative (BPMI.org). It provided the first XML-based language for executable processes based on the Pi-Calculus model and the standards-based Web services stack. It laid the foundation for the development of BPEL4WS. Its development was suspended when BPMI.org joined forces with OASIS to develop future versions of BPEL4WS.

The Business Process Modeling Notation (BPMN) is the first standards-based graphical notation for business processes and is being developed by BPMI.org. It lets business analysts, process designers, and software engineers graphically design end-to-end business processes that can be automatically translated into fully executable processes using the BPEL4WS language. When completed in second or third quarter this year, it will support XML-based serialization into XML Metadata Interchange (XMI) using UML profiles, therefore allowing exchange of business process designs between business process modeling tools, as well as interoperability with UML 2.0.

| Analysis and Design | Execution | Monitoring and Analysis |
|---|---|---|
| • Process knowledge discovery and analysis<br>• Graphical process modeling notation<br>• Business process specification<br>• Technical process specification<br>• Metrics specification<br>• Resource specification<br>• Business transaction definition<br>• Technical transaction definition. | • Resource assignment<br>• Scheduling<br>• Executable process languages<br>• Service/activity centric orchestration<br>• Process-to-process interoperation<br>• Federated/distributed process invocation and coordination<br>• Transaction execution. | • Process query languages<br>• Event/metrics query languages<br>• Analytical languages<br>• Activity monitoring<br>• Process monitoring<br>• Event monitoring<br>• Process audit trail schemas<br>• Process audit trail query. |

Figure 1: Categories of Standards Functionality

The Business Process Query Language (BPQL), currently being developed by BPMI.org, will be the first standards-based query language for business processes. BPQL will support the deployment of business process definitions onto a process server and the real-time querying of process instances. BPQL is expected to be released in the fourth quarter of 2004.

The Business Activity Monitoring Language (BAML) will support the definition of process metrics, monitoring instruments, monitoring filters, key performance indicators (KPI), and process dashboards. BAML is expected to be released in fourth quarter.

The Business Process Audit Trail Schema (BPATS) will provide a standard XML Schema for the serialization of process instances based on BPEL4WS process definitions. Both BPQL and BAML will rely on BPATS. BPATS is expected to be released in the fourth quarter.

The Web Service Choreography Interface (WSCI) was the first standards-based language for defining the public interface of business processes. It was developed by BPMI.org, BEA, Intalio, SAP, and Sun Microsystems, then donated to the World Wide Web Consortium's (W3C's) Web Services Choreography Working Group. It supports the mapping of alternative public interface process models such as RosettaNet Partner Interface Process (PIP) onto the BPEL4WS and BPML execution models. WSCI public interfaces are functionally equivalent to BPEL4WS abstract processes, which are considered the standard mechanism for defining the public interface of business processes. WSCI supports message choreography, transaction boundaries and compensation, exception handling, thread management, and dynamic participation of Web Services.

WS-Transactions support the propagation of a transaction context across multiple parties over the Internet using Web services interfaces. It brings to the Web services stack the transactional services originally offered by CORBA through Internet Inter-Orb Protocol (IIOP) and XA/Open interfaces. It extends such services with additional transaction semantics that take advantage of asynchronous and XML-based messaging protocols.

The Business Transaction Protocol BTP from OASIS enables the coordination of requests, responses and outcomes for distributed applications involving multiple business entities. It supports atomic transactions, as well as permitting outcomes that are more flexible than all-or-nothing, but which are nonetheless agreed upon by the participating entities. BTP is potentially important as a BPM-related standard since a BPMS is often required to support complex business transactions. WS-Transactions supercedes the work done for the Business Transaction Protocol (BTP), but is only a vendor proposal at the time this article is being written.

The ebXML Business Process Specification Schema (ebXML BPSS) from OASIS provides a schema for partially executable business processes defined through business-level constructs. BPSS defines collaborative business-to-business (B2B) processes in terms of a sequence of typed message exchanges (BPSS business transactions) and defined message contents. It provides a slightly higher-level modeling abstraction for business processes compared to block-structured process languages, such as BPEL4WS and BPML, and can be mapped onto those to offer a seamless path to execution.

The XML Process Description Language (XPDL) is an XML-based description language for workflow processes based on the Petri-Net mathematical model. It addresses both human and, to a lesser degree, automated activities, providing a transition model of the control flow based on an abstract document known as a case. Only activities modify the case. It supports the concept of resources, organizations, and both nested and chained processes, but does not support collaborative process, transaction, or exception semantics. Developed by the Workflow Management Coalition (WfMC) primarily for process definition interchange, it's a strict functional subset of more general block-structured process languages such as BPEL4WS and BPML, and so can be mapped onto those languages.

The Process Specification Language (PSL) from the National Institute of Standards and Technology (NIST) defines a neutral representation for manufacturing processes; it's an industry-specific process specification language that can be mapped onto block-structured process languages such as BPEL4WS and BPML to offer a seamless path to execution.

Integration Definition (IDEF) standards are Federal Information-Processing Standards originally derived from the U.S. Air Force Integrated Computer-Aided Manufacturing Architecture. IDEF0 Function Modeling Method (a.k.a. FIPS 183) is a process-mapping standard consisting of a high-level map of the major business processes a company uses, and a second level that provides functional decomposition of these processes into ever-finer sequences of activities by describing decisions, actions, and activities. It has found considerable use in BPR activity models.

The IDEF3 Process Description Capture Method provides a methodology for discovering, collecting, and documenting high-level, non-executable business processes. It has found considerable use in BPR process models. Called "swimlanes," rows (or alternatively, columns) are often used to assign responsibility roles. As part of the overall IDEF framework, it provides a vendor-neutral alternative to enterprise frameworks such as ARIS, Catalyst, and Zachmann.

UML is managed by the Object Management Group (OMG) and provides two primary diagramming standards for process description. Use-case diagrams describe the relationships and interactions between functions and environmental actors. UML activity diagrams are sometimes used to model process flows as state transitions. Activities are assigned responsibility roles, and designated graphically as swimlanes. Additional UML diagramming standards for process description are being considered. **bij**

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# THE ROLE OF BAM

By Mani Chandy, Ph.D., & David McGoveran

The relationship between business activity monitoring (BAM) and business process management (BPM) is an intimate one. Identifying the value and proper use of these technologies can be difficult, given the buzz about them and the variety of features offered. We discuss features of BAM and BPM, identify commonalities and differences, evaluate target applications for each technology, and explore the opportunity available to your business from integrating these technologies.

Human activities can be placed in a spectrum based on the sophistication of reasoning that we employ. These activities may range from breathing, walking, driving, responding to threats and opportunities, and developing business plans. Activities that use more sophisticated reasoning also have larger fields of vision. When you walk, you need only look a few feet around you; whereas when you drive, you need to be aware of a much larger environment. When you're developing a business plan, you need to be aware of global situations.

Information technologies leverage human capabilities, and they've done so historically by moving up the spectrum from capabilities that require less sophisticated reasoning and limited fields of view to more sophisticated reasoning and larger fields of view. The entire sweep of IT history demonstrates this; from the era of punched cards and automatic data processing, to simple business process automation (analogous to walking), to EAI and workflow (analogous to driving), and currently moving into the era of BPM, BAM, and the real-time enterprise (analogous to a worldwide military command and control system).

Eventually, IT will move to the adaptive, learning enterprise. While the initial focus of BPM's predecessors (such as workflow management) was on automating important but well-understood and repetitive activities, the focus of BPM is on enabling rapid, efficient, and measured change to all business activities that can be understood as part of a business process. A focus of BAM is on leveraging human capabilities further up the spectrum: rapid, appropriate response to threats and opportunities.

Process control has been used in manufacturing for decades. The chemical industry has gained a great deal of experience from chemical plants that have operated efficiently with a high degree of automation. As costs of services rise, businesses are mapping from engineering process control concepts to BPM. Many of the features of BPM have analogs in process control. Examples include automation, decision support systems and rules engines, monitoring tools and displays.

BPM technologies manage business processes, including their design, analysis, execution, measurement, and modification. BPM helps automate process flow, relieving human decision makers from having to make repetitive decisions that can be encoded within an algorithm. BPM infrastructures monitor and record the flow of documents >

and actions; this record can help in identifying transient problems such as a lost insurance application and, equally important, help in identifying systemic logistic problems such as poor response times in some departments. Business processes can be automated across multiple systems and a variety of applications, so BPM technology can also be viewed as a natural extension of EAI. Dashboards display data and key performance indicators related to business processes monitored by BPM infrastructures.

In our analogy of a hierarchy of human activities, when we start to learn to drive, we use our brains at every point and drive slowly. Later, the activity becomes increasingly instinctive, following repeated patterns, and we drive faster. BPM infrastructures help in reducing the amount of human participation in repeatable business processes, freeing the brainpower of your employees to more creative tasks.

BPM doesn't stop there. Its real value comes from its ability to enable rapid, knowledge-driven change of the business process, whether to enable higher levels of efficiency (business process redesign), create new business processes to address new opportunities (business process creation and innovation), or to realign business processes with strategic business objectives. This is analogous to enabling the driver to choose better routes that will avoid traffic problems, save time, or increase fuel efficiency, or to drive to entirely new places.

BAM has many of the same technological ancestors as BPM. In addition, BAM's technological forbears include business intelligence (BI), autonomic control of technical systems, such as information systems and manufacturing, and military command-and-control with its emphasis on responding to (possibly unexpected) threats and opportunities within time windows. BAM emphasizes detecting critical situations and responding within time windows. The main features of a BAM infrastructure are sense-analyze-respond, coupled with tools for monitoring, display, design, and deployment.

Though the ancestries of BAM and BPM technologies are slightly different, the boundaries between them are definitely fuzzy. BPM's emphasis on enabling and managing business process change depends on the sense-analyze-respond cycle. It therefore necessarily includes BAM insofar as BAM relates to business processes, comprising activities and decisions that can be monitored and measured.

In our analogy of how IT leverages human capabilities, BAM deals with activities that require sophisticated reasoning and larger fields of vision than most consider appropriate to BPM. When we detect threats to the success of a business trip to several countries, our "fields of vision" include weather at these countries, terrorist threats, delays in flights, and possible changes in hotel accommodations. The reasoning we use is more sophisticated than the reasoning we employ to drive.

If one accepts the BPM thesis that most business activities occur in the context of some business process, then the objective of monitoring and measuring, correlation and analysis, and response within BPM becomes identical to the objective of BAM. Likewise, the BAM sense-analyze-respond cycle can then be understood as measuring the results of some business process-related activities or event streams, correlating and analyzing those results, and then determining subsequent activities (the response). The BAM response will then include activities within the same business process (i.e., next steps in the flow) as well as possibly triggering events or influencing activities in other business processes. BAM includes the flow control aspects of BPM. Under this interpretation, BPM and BAM technologies merge into a single framework that supports the adaptive learning enterprise.

The difference between BAM and BPM is largely one of focus. BPM treats events in the context of business process, while BAM treats business process in the context of events. In BPM, the focus is on understanding and managing activities and events as being necessarily related to and occurring in the context of a well-understood, repeatable business process. That business process context might be constrained to a particular process instance, the entire history of process instances, or even a group of related business processes. Recent improvements in BPM technology have enhanced representation, control, and incremental change of repeatable business processes, with improvements to the sophistication of monitoring, measurement, analysis, problem determination, and response being perceived in the industry as slightly lower priority.

By contrast with BPM, BAM focuses on real-time understanding of the global state of the extended environment of an enterprise, and managing activities in response to changes in this global state. Specifying repeatable business processes is less critical for BAM. Primarily because not all business processes are highly repeatable, let alone automated or even documented, it can appear that some events and activities are unrelated to business process. BAM technology improvements have emphasized broadening the range of events that can be sensed and categorized, with sophisticated improvements in analysis and response recommendation or automation being high priority.

BAM emphasizes responding to the extended environment of an enterprise that may include competitors, governmental organizations, and news organizations. Defining schemas for repeatable business processes that span all these institutions in the extended environment is impossible because these institutions (e.g., competitors) may not cooperate in defining repeatable processes.

Both BPM and BAM process events. Events fall into a spectrum ranging from frequent events for which the enterprise has event-handling processes in place to the occurrence of totally unexpected threats or opportunities. An example of an expected event is the completion of each step in processing an insurance claim. The completion event signals readiness of the business process to execute the following steps. An example of an event that's less expected is a delay in the arrival of a critical part that delays shipment of products to critical customers and results in massive performance penalties. An example of an even more unexpected event is the sudden announcement of a competitor's disruptive innovation, or the impact on business continuity of a natural or man-made disaster. Though BPM and BAM will eventually cover the entire spectrum of events, a simplistic differentiation of the current status of BAM and BPM is that BPM focuses on the expected end of the event spectrum while BAM focuses on the unexpected end.

An emphasis on responding to possible surprises implies that a critical feature of BAM is the ability to "fuse" data in databases, message queues and applications with streams of events from within the enterprise and from partners, competitors, customers, the government, and the markets. Eliciting critical information from vast amounts of data is a function of BI in the business world and military intelligence in the military.

The difference between BAM and traditional BI (including enterprise performance management) is one of emphasis. The emphasis in BAM is on

responding to events within time-windows of opportunity. The emphasis in BI is to support humans making sense of large data repositories by analysis and experiments that may take hours or days. The relative importance of time-criticality implies that BI and BAM use somewhat different tools for correlating data (see Figure 1). BAM event-detection tools can be applied to streams of events as they're entered into a repository for later in-depth analysis using BI tools. Though the current emphases are different, we expect algorithms and technologies used in the event detection part of BAM to become integrated with "real-time BI."

The detection of events in the extended enterprise, including partners and competitors, implies that BAM infrastructures include sensors to obtain information from Web services, Websites, file transfer protocol (FTP) sites and stock feeds from outside the enterprise as well as Web services, message queues, databases and application programs from within the enterprise. Sensor technology, generally forming its most general form, is an integral part of BAM. By contrast, BPM technologies deal primarily with sensors in the enterprise. The data streaming from sensors into BAM infrastructures is often heterogeneous and may include numerical data on flows of gas along pipelines, structured data such as purchase orders in XML schemas, semi-structured data such as tables at competitors' Websites, and unstructured data such as news stories.

In most current BPM implementations, the decision about which processing step to execute next is usually made based on relatively local data. The same decision in BAM is made based on relatively global data. Although neither definitional for BPM nor appropriate to its vision, this distinction is important, given the state of the technology. For example, in a BPM application, when a purchase order arrives at a mail-order retailer's warehouse, a condition is evaluated to determine if the items ordered are all available locally. If the items are available locally, they are shipped out; if not, the next step is executed, which is to determine the optimal locations to obtain these items. By contrast, in a BAM application, the determination of how to respond to a lengthy delay in delivery of a part to a manufacturer is based on:

- Which products are affected by this part
- Which customers are waiting to get the product
- How important these customers are to the enterprise
- The availability, prices and reputations of alternate suppliers of the part
- Evaluation of the option to buy the product from competitors.

The specifications of threats, opportunities and responses change more frequently in BAM applications than specifications of process flow change in BPM applications. Thus, the ability for business users (as opposed to IT users) to change these particular specifications in a running system is, generally, more important in BAM than changing process specifications on-the-fly in BPM applications.

BAM systems help in responding to the unusual and hence they must be able to capture, if not learn, what is "usual." Detecting anomalies requires an estimation of a baseline. The detection of outliers requires estimation of clusters. That's why BAM technology uses time series statistics, parametric analyses, machine learning, and other areas of information science associated with signal processing, statistics and pattern recognition.

The response part of a BAM sense-and-respond application is usually implemented in some form of BPM infrastructure. At its simplest, the response is generating an alert at a dashboard. More complex responses include initiation of business processes. BAM events can trigger BPM responses, and BAM may fuse streams of events generated by executions of BPM flows to generate complex events.

A BPMS without BAM is merely process automation or process integration. The basis for any management decisions, whether in managing business process change or in managing the business through process, is simply missing. BAM without BPM is a sophisticated sense-analyze-alert engine; with BPM, it's a complete sense-and-respond platform with adaptive potential.

We expect these information technologies to converge into platforms that leverage human activities at the top of the hierarchy of sophisticated reasoning and global fields of view. The vision of a BPMS with integral BAM will help automate repetitive, well-understood business processes, support responses to threats and opportunities, and support enterprise adaptation and enterprise learning. By reducing the amount of attention that must be paid to more mundane processes, business managers and their supporting staff will be able to spend more time on creative activities, which is clearly a sustainable business advantage. **bij**

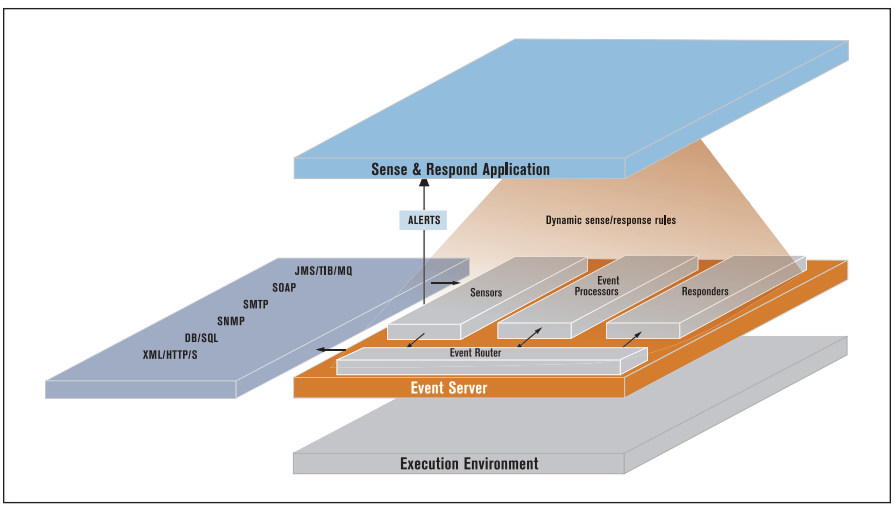


Figure 1: BAM Infrastructure

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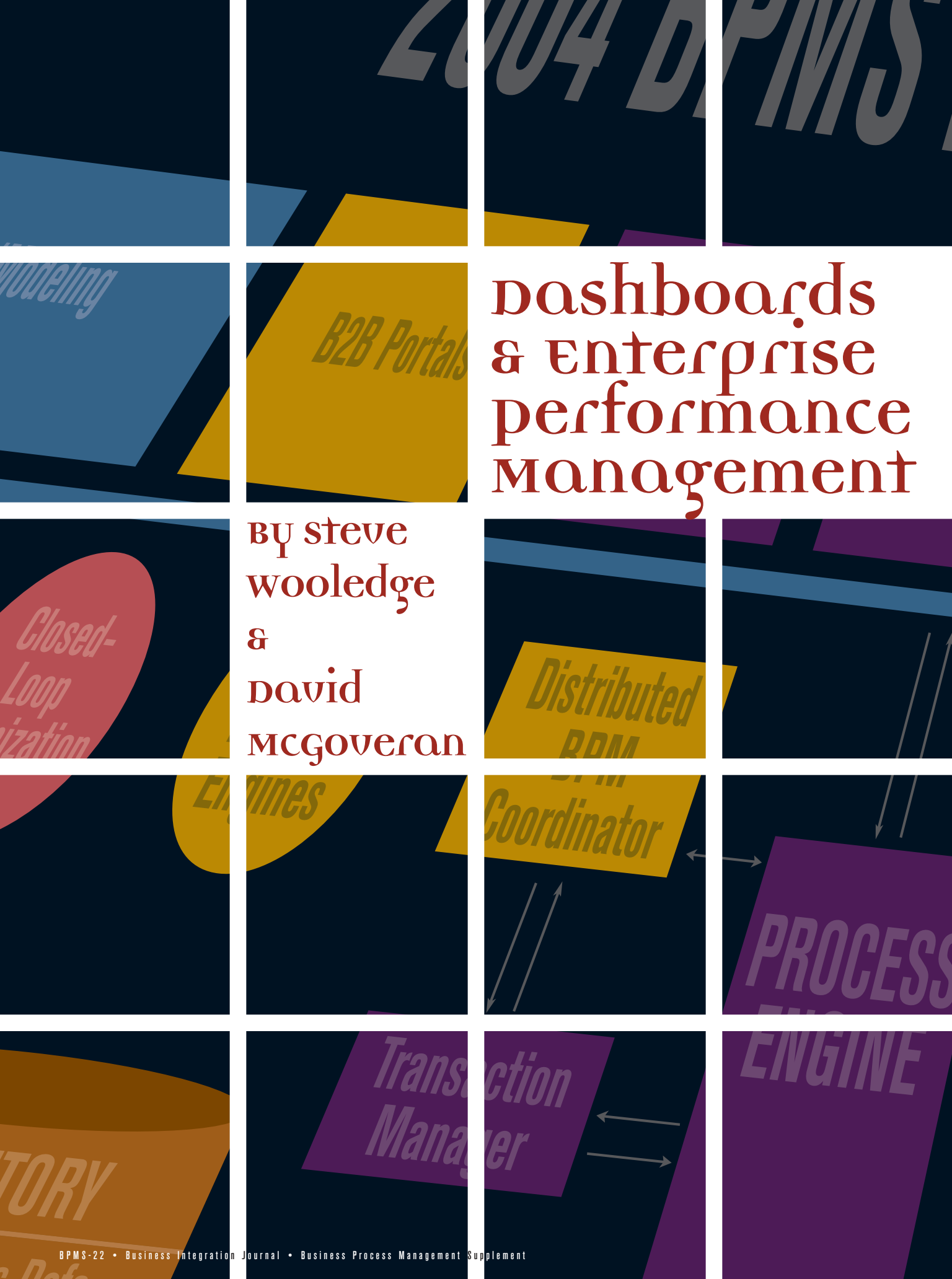


# Dashboards & Enterprise Performance Management

By Steve Wooledge & David McGoveran

Enterprise performance management (EPM) is informally defined as "a systematic, data-oriented approach to managing people at work that relies on positive reinforcement as the major way to maximize performance." EPM is enabled by data and technology that give people access to enterprise performance metrics, or key performance indicators, to measure and improve the speed and effectiveness of organizational operations.

Organizations from every industry face similar challenges: increased competition, fewer resources, and less time to react to changing market conditions. Increased transparency to external forces has increased the scrutiny on organizations, while simultaneously lowering barriers to entry for competition. Often, companies become so worried about these external forces that they get preoccupied with pleasing investors and auditors while fending off competition. They then neglect the assets that matter most: the people, processes, and goals that drive their organization's performance.

When organizations fail, it's often not because of a flawed strategy, but their inability to effectively communicate and execute the strategy. By implementing EPM processes and tools, you can give people dashboards that provide the information necessary to track progress against goals (see Figure 1). Aligning people with goals, metrics, and processes helps the organization overcome challenges and maintain competitive advantage.

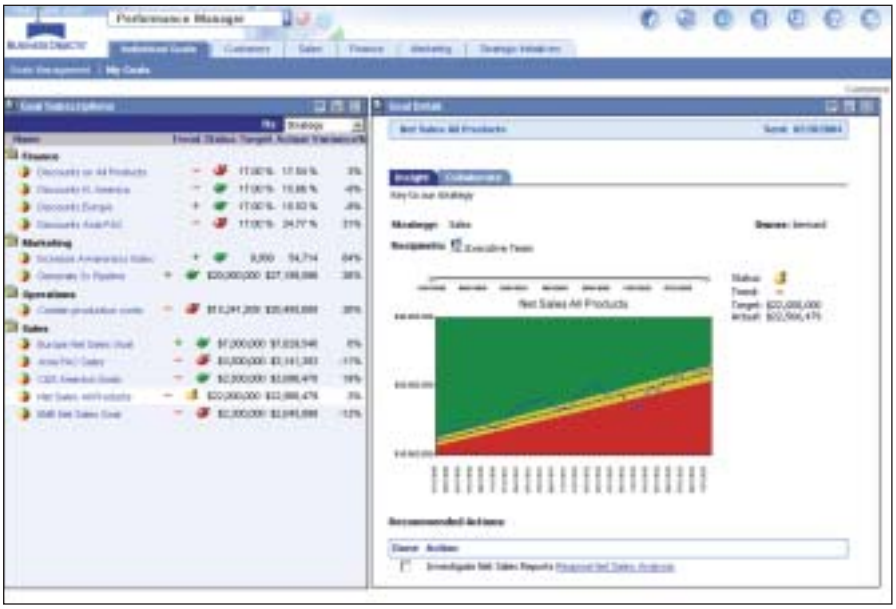

Figure 1: EPM Dashboard With Goals Management

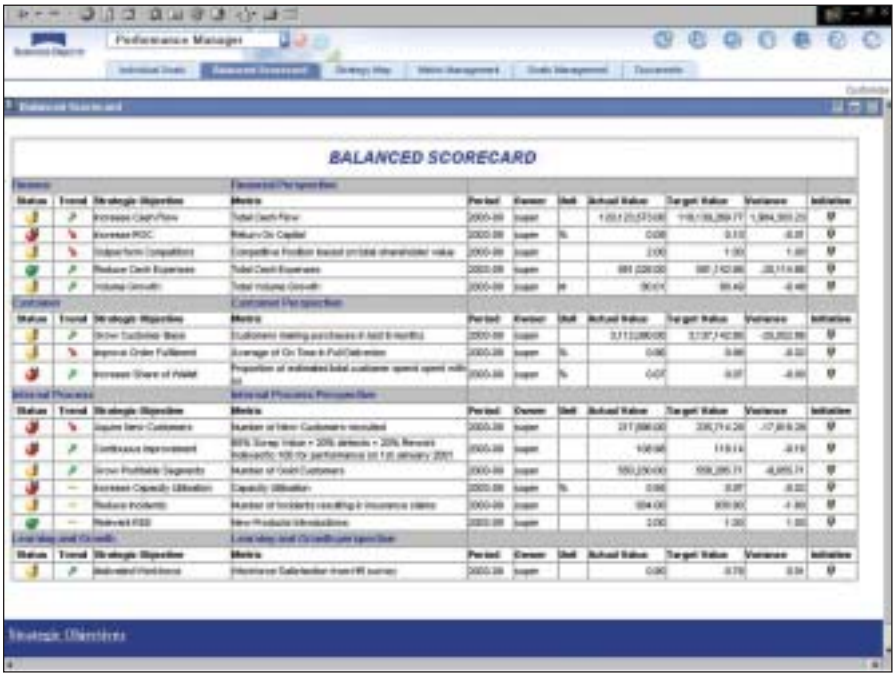


Figure 2: EPM Dashboard With Balanced Scorecard

An EPM solution gives every person in the organization, regardless of title or responsibility, access to a dashboard to help them track, understand, and manage their daily business. Its primary goal is to achieve organizational accountability and control. We'll explain how an EPM solution helps achieve this goal. As you'll see, EPM helps personnel become accountable, motivated, measured, and appropriately rewarded. We'll also explain how EPM is related to both business process management (BPM) and business activity monitoring (BAM).

## The Problem

What happens after leaders and managers deliberate and decide the best strategy to win in the market? Do they lock it up in an annual report, or post a bulletin board in hallways, hoping their staff will rally around the cause? Unfortunately, "yes" is a typical answer. It seems like the perfect "Dilbert" cartoon. The employees wander around, wondering what to do, when suddenly Dilbert sees the new corporate strategy displayed next to the coffee machine: "Delight the customer, be number one in market share, and lower costs through 'operational excellence.'" Dilbert would say, "Aha! That's what I need to do! Lower costs! I'll throw this coffee machine out the window to decrease our variable costs for coffee beans." The ramifications of such responses would be inappropriate and ultimately devastating.

EPM provides a way to give every employee a view of the business on their computer through a personalized, but corporate dashboard, often with a balanced scorecard display (see Figure 2). Examples of balanced scorecard tools include:

- Strategy maps, which connect desired outcomes to drivers via cause-effect chains (see Figure 3)
- Metric trees, which provide decomposition of key performance indicators into source measures (see Figure 4).

With balanced scorecard displays, you can communicate strategic objec-

tives and how everyone affects them. But effectively communicating the strategy and goals of the organization isn't enough. There must also be accountability to ensure that people act congruently to support top-line goals and strategies.

Can this be achieved through allocating budgets for departmental resources and reallocating based on actual vs. planned achievement? Well, sometimes. But many goals aren't as measurable as net income. For example, simply increasing the sales department budget doesn't ensure increased revenues or market share. Additionally, most budgets are set on an annual basis. What happens when market conditions change monthly or weekly? The need for a flexible EPM system that takes all the organization's goals into account is paramount, whether those goals are quantitative financial measures or qualitative measures such as "customer loyalty." This makes everyone accountable by assigning them specific, measurable goals, whether they have a budget or not.

Through a dashboard, people can be alerted when any goal isn't being met. They can then analyze trends and discover root causes. Moreover, an innovative EPM system lets users analyze the business, collaborate with co-workers, and take action to get operations back on track. Flexibility is required because no two organizations are identical and neither are the processes or systems that help them succeed. Your business processes shouldn't have to follow a technology vendor's definition of operational excellence! The dashboards created for your users need to be easily configurable to achieve organizational fit. They should support changes easily as new conditions warrant.

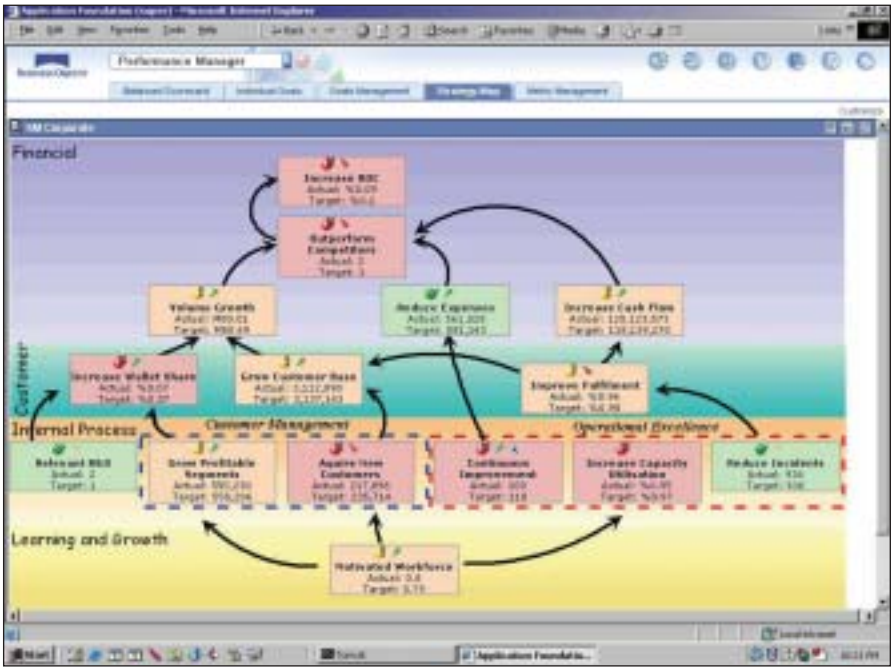


Figure 3: Strategy Map

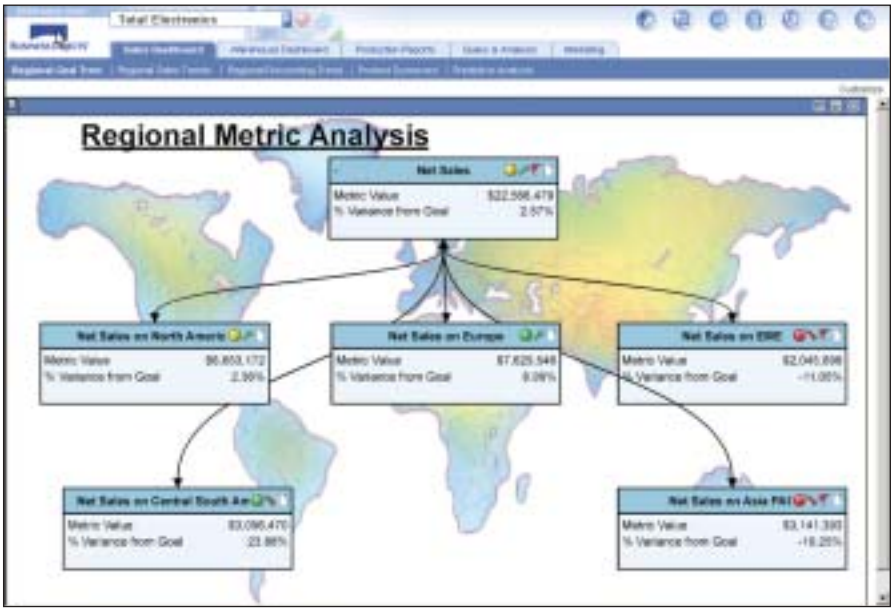


Figure 4: Metrics Tree

### Achieving Strategic Performance

EPM sounds easy enough, but where should you start? There may be thousands of people in your organization, each with varying roles and responsibilities, with each depending on one another to accomplish many goals that are cross-functional and globally dispersed. Tying each person's performance to organizational goals sounds challenging and expensive, like boiling the ocean, but it really doesn't need to be that difficult.

The first step is to realize that performance management can be applied to any business process within the organization where there's a need to view and analyze all the points of measure, or measured objects, that define enterprise performance, productivity, and profitability.

A "measured object" is an identifier for a person, place, or thing the performance of which can be measured and displayed in a dashboard. Tracking performance of each measured object requires "metrics." A metric is defined as a measurement over time of a variable that's meaningful in judging the performance of something. Most important, metrics must have goals associated with them that benchmark performance and act as a grading scale to give the metrics meaning relative to top-line strategies.

You can then take the following five-step methodology and apply it to any process:

1. Identify a specific business pain and determine the associated causes deterring success. This can be phrased in terms of a strategy to achieve an objective and impediments to that strategy. For example, if the organization's strategy is to gain widget market share by having the lowest costs on its manufactured parts, giving pricing power and com-

petitive advantage in the market, start by determining the reasons for not achieving this low-cost approach.

2. Determine the operational goals that must be set to get operations aligned with this strategy. For example, a goal may be to lower widget raw material costs by 10 percent over 12 months and a simultaneous goal may be to lower production variable costs by 5 percent over six different months.

   Once the operational goals are determined, you must determine the objects to measure, their associated metrics, and the frequency of measurement. It's much easier to hold someone accountable if they can track their individual performance in a dashboard and where they stand relative to peers. For example, if lower raw material costs is the goal, what can you measure that affects this goal? Perhaps there are 12 buyers in different regions, each buying the same part from different suppliers. Is it enough to have a "widget monthly spend" metric, or would it be more meaningful to show each buyer's monthly spend per unit and compare this to the goal for each buyer?

3. Different objects may be measured with differing frequencies. For example, cost per unit may only be measured monthly, whereas production efficiency may be measured daily. Given this variability, an EPM dashboard should have metrics that are flexible enough to accommodate an organization's individual needs.

4. Identify business rules, or thresholds, for immediate action. As the EPM initiative grows in scope and complexity, there will be terabytes of performance data generated. It's an overwhelming task to manually monitor all this activity. The solution is "management by exception," or automatically detecting when a metric isn't in compliance and providing notification through the dashboard. Knowing the business rules that trigger alerts and a need for action is critical in focusing efforts on areas that need it most. The EPM system must be able to monitor metrics and proactively notify users when a threshold is reached.

5. Determine who needs to act, and what recommended actions should be taken. This brings us back to accountability. You may be measuring raw material costs and realize your spending is out of control in the eastern region. What steps should be taken to diagnose the situation and who is responsible for taking action? By giving employees an EPM dashboard that's integrated with a business intelligence (BI) information infrastructure, you can easily guide users to the data and reports they need to analyze the root cause of the situation and take action to get operations back on track.

**A primary goal of an EPM solution is to achieve organizational accountability and control.**

Moreover, once misalignment between performance and goal has been addressed, the accountable party is likely to have discovered some key lessons. Perhaps the "pricing report" they were guided to in their dashboard lacked the necessary information to really diagnose the problem. Perhaps they learned a more efficient way to tackle the problem. Whatever the case, the ability to measure the efficiency of the business process or individuals involved helps you identify opportunities for improvement. Refined best practices can then be re-established and easily implemented, becoming the recommended actions the next time this situation arises. This iterative approach enables optimization of the business processes used to manage performance.

As this five-step methodology is applied throughout the business, and supported using an EPM tool flexible enough to meet your needs, the puzzle pieces begin to come together. A clear view of how to achieve your performance goals will develop. Strategic alignment can be achieved by using dashboards and other tools to communicate strategies and goals throughout the organization and to define common metrics.

### Closing the Loop: EPM, BAM, and BPM

EPM uses data-centric monitoring of performance metrics to detect and report exception events via dashboards, enabling the analysis of causes and recommending actions for improving performance. Both EPM and BAM require monitoring large amounts of data, sophisticated analytical techniques, and dashboards for notification. By contrast with EPM, BAM focuses not so much on accountability and strategic performance improvement based on the relationships between objectives and trends, as on business improvement through real-time detection and response to operational events. Both approaches are clearly complementary, compatible management techniques.

Keeping in mind that every business process and activity is defined as having at least one measurable objective, it's easy to see that BPM and EPM converge when the EPM metrics tree is aligned with business process. This can be achieved either by overlaying the process hierarchy (decomposed by function and responsibility) with the metrics tree, or by bottom-up composition from performance measures of process activities. When this is accomplished, the strategic performance improvement capabilities of EPM become integrated with BPM.

Closing the loop between strategies, goals, and individuals with an EPM architecture lets you assign accountability, monitor progress toward goals, and take action to get operations back on track with objectives in the event of a miscue. Capturing best practices of high-performance individuals and sharing these throughout the organization help align performance across all areas of the business. EPM isn't just another "buzz" term surrounded by empty promises or a new topic of ridicule in a "Dilbert" cartoon. It can and should be a pragmatic approach to aligning an organization's people and business processes with strategic objectives through dashboards, enabling organizational vision to become reality. **bij**


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# Implementation: Issues and Strategies

BY DAVID McGOVERAN

Embarking on a business process management (BPM) project is simultaneously full of promise and challenge. Technologists often overlook some of the more important aspects of BPM adoption, namely those having to do with business change and commitment. Successful BPM adoption, including implementation of the technology, requires that attention be given to the impact of BPM on the business, its organization, and its practices.

## Become a Process-Centric Organization

To obtain the greatest benefit from BPM technology, the organization must ultimately become process-centric. As discussed elsewhere in this BPM Supplement, a BPM approach implies a commitment to understanding, measuring and managing business activities and decisions in terms of the business processes they underlie. Even for a reasonably well-bounded business process, with explicit, measurable objectives, changing the affected portion of a business to this mindset can take as much as a year.

Much has been written on how to become a process-centric organization. Although little of that literature has explicitly taken into account the potential impact of BPM technology on this effort, it's well worth reading. Keep in mind, however, that BPM ultimately requires more than adopting a mindset. BPM also requires a set of practices that are closely related to those found in Six Sigma companies.

Implementation of a BPMS requires a greater commitment to precise definition of processes, activities, goal specification, and measures at all levels of detail than is typically required in, for example, business process re-engineering efforts. Of course, this precision need not be achieved all at once (an extensive business process analysis isn't necessarily required upfront), but can be improved continuously over time. This is one of the key advantages of using a BPMS. It enables the incremental documentation of process knowledge, since definitional deficiencies become apparent through operation and are correctable.

Establishing a Process Competency Center, consisting of business and some technology leaders that will acquire the necessary knowledge of BPM and then guide BPM adoption, is highly recommended. Among the specific goals of the center should be making certain that the technology is aligned with the business, rather than the other way around. Among other things, this means the selected BPMS should enable business users to interact with it in terms of business concepts rather than technology components. This aspect of BPM technology is not yet mature, so the center must be vigilant in seeking improvements.

Most BPMS products force the user to learn something about the technical infrastructure that will ultimately implement a business process. Worse, users are often forced to redefine a business process to capture its description with the available tools. BPM process modeling tools generally focus on capturing a process definition that can be automatically converted into a process execution specification, which is usually highly structured and repeatable. By contrast, actual business processes range from highly structured and repeatable to unstructured and even ad hoc. >

### BPM Goals and Technology Selection

Among the key steps in adopting BPM and implementing a BPMS is identifying goals. BPM addresses both strategic and logistic issues. Strategic goals include improving agility so the organization is more responsive to external events. This capability, unique to BPM, translates into support for rapid process change and innovation; it enhances an organization's ability to meet longer-term strategic objectives such as improving revenues or margins, lowering costs, competitiveness, and so on. The ability to address strategic issues is contingent upon understanding the relationship between strategic and logistic goals, and aligning the two. Logistic goals are the most commonly pursued, and pertain to efficiency of operations. Examples of logistic goals include:

- Improving process step quality, cycle times and repeatability
- Removing bottlenecks, reducing resource waste, idle time and unnecessary latencies
- Making certain that materials and information are available for activities.

Selecting an initial, feasible set of goals to be achieved through BPM is essential to scoping. The expected business benefits of achieving these goals through BPM should be clarified in advance.

Once reasonable goals are identified, it becomes possible to select and prioritize those key business processes which, when subjected to BPM implementation, will contribute most significantly to achieving those goals. This leads to a time-phased set of requirements determined by the complexity of the business processes in order of priority. There are many BPMS and BPM technology vendors whose products can be evaluated during the technology selection process. Care should be taken to ensure that the technology is evaluated with respect to its ability to support the key business processes and to achieving the target goals. Secondarily, both the ability of the vendor to improve their product, and the alignment between the vendor's technology road map and time-phased requirements, should be taken into account.

### Selecting and Implementing a Pilot

Some choices of business process are inappropriate subjects for a pilot (i.e., first) BPM project. On the one hand, if the selected business process is too simple, it's unlikely that BPM will deliver much return on investment. On the other hand, if the selected business process is too complex, the entire organization can be put at risk. The selected business process should simultaneously be highly visible, have bounded but significant risk, some known inefficiencies, quantified exception processing and repeatability, and moderate resistance to change. Choosing such a business process for the BPM pilot forces management participation and experience with organizational and operational change, while providing the opportunities to learn the value of BPM in a reasonable time. In many cases, relatively simple business process changes can yield huge dividends. For example, consider selecting business processes in which automating the notification of exceptions, thereby enabling early response to costly inefficiencies is easily achieved with the BPMS.

The first step after selecting a specific business process should be to establish a baseline business process definition. This involves identifying both the normal processing activities and those exception-processing activities that will account for a high percentage of the throughput. It's then necessary to identify, for the entire process and each of the activities and decisions it comprises, the measurable objectives and the resources necessary to achieve those objectives. The concept of "measurable objectives" is loaded, implying that an objective is meaningless unless the degree of its success or failure (perhaps binary) can be assigned a quantitative or qualitative measure. In turn, this implies the identification of well-defined, repeatable, operational methods by which the measure can be assigned to a metric variable.

Note that this definition doesn't exclude the use of subjective or inferential judgment, but only requires that the method of obtaining that judgment is well-defined, repeatable, and operational. Obviously, developing more objective, quantitative measures should be an ongoing goal. Metrics associated with detailed activities should provide a base from which to derive higher-level metrics and ultimately key performance indicators, forming a metrics tree. Once the metrics tree is understood, it becomes possible to monitor the existing business process execution and establish an operational baseline. It's against this baseline that the effects of a BPM implementation are compared and contrasted to determine ROI or other measures of project value.

Adopting BPM must not be understood as a task to be completed (except in the unlikely case that the business process executes in isolation from the business environment's usual influences). It's a business philosophy that requires ongoing application. Not only is there tremendous opportunity to improve most business processes, but changing strategic goals, regulations, new technologies, competitive events, supply chain variability, workforce availability, acquisitions and merger, divestitures, and so on give rise to the need to modify or even to create new businesses. Active attention to, and maintenance of, a BPM implementation is required as long as the business can change. After all, from a process-centric view, business processes are the business.

### Select an Implementation Strategy

Attempting to deploy a BPMS, or any mission-critical system for that matter, without having a strategy is asking for a lot of pain or something worse (like outright failure). A BPM implementation strategy is a well-defined plan of action with an identified schedule, objectives, risks, and quantifiable costs and benefits. A comprehensive discussion of specific strategy alternatives is too complex for this supplement, so we will explain the key types of strategy instead. Strategies are classified as bottom-up, dispersive, accretion, or top-down, according to the deployment plan used. The deployment plan dictates which business objectives can be met first, which components should be deployed first, and which portions of the organization will be affected most directly. Let's consider each of these strategies.

The most common type of strategy is bottom-up, which means the BPMS is layered on top of a technology integration infrastructure. For obvious reasons, EAI vendors and IT departments find this strategy type convenient since they've already begun tackling the problems of technology integration. Pilots are typically restricted to a department or to one interdepartmental (cross-functional) business process. In this context, BPMS is seen as providing process (or even message-flow) integration and technology orchestration, being a means of coordinating the various applications that support a business process.

The process engine will generally focus on process automation, possibly have human-centric workflow capabilities added, and provide more technical (vs. business) activity monitoring. The

process model will be only an idealized technical substitute for the actual business process. This means business managers will have some difficulty interacting with and benefiting directly from the BPMS, so that business objectives are reduced to simple overhead reduction or even to technical objectives (logistical effectiveness).

This type of strategy initially treats a BPMS as a new layer of middleware. Eventually, additional business process modeling (vs. modeling technical services orchestration or choreography), business activity monitoring (BAM), analysis, forecasting, and control are added. This strategy type permits the organization to learn the benefits of a BPMS over time. However, it risks losing the support and interest of business management, and failing to reach the potential the BPMS offers to the business. Only a concerted effort to achieve faithful mapping between business process definitions and technical flow definitions can mitigate this risk. It's particularly attractive to IT, which readily understands the implementation technology and its technical benefits as deriving from choreographing technical services.

The dispersive type of strategy introduces BPMS selectively to address specific business problems that occur throughout an organization. It starts as multiple islands or silos of BPM, usually in an attempt to implement operational standardization and gain control over targeted business costs (logistical efficiency). These islands are initially connected functionally rather than through process integration, and may eventually be replaced with a federated BPMS. Local business performance measures are often rolled up to higher organizational levels through data integration means, such as a data mart or an enterprise portal, rather than through integrated BAM and enterprise process management (EPM).

As additional business functions are treated, the scope of each local business process increases until the islands eventually become process-connected. The process engine will often emphasize human-centric workflow, with perhaps limited process automation capabilities. This type of strategy is tactical from a business perspective, and doesn't depend heavily on a common EAI infrastructure. Web Services interfaces tend to work well for local process integration of automated activities. It provides rapid, measurable business benefits that middle managers can easily understand, but risks not having the support of sufficient technical integration as enterprise-level processes emerge and functional scope expands from operational to strategic business objectives. This type of strategy is becoming popular because it lets the organization adopt high-return vertical solutions of controlled scope, but without having to wait for BPMS maturity.

The accretion type of strategy selects a particular (perhaps small) business operation and introduces BPMS throughout. Its scope is initially limited to all the existing business processes under the control of a specific (perhaps quite small) management team, all of their objectives, and all of the technology infrastructure necessary to support the operation. The scope can grow both horizontally—through organizations that are process-connected to those already using the BPMS, and vertically—through the additional organizations that fall under the increasing managerial scope as we move up the corporate structure. At no time is this type of strategy a "big-bang" approach: it literally grows outward from a successful center or seed.

An accretion type of strategy requires a well-architected BPMS with all the components we've discussed elsewhere in the BPM supplement, even though these components need not be mature technologies. The type of strategy yields measurable business benefits (both tactical and strategic) in a reasonable timeframe, can grow with the development of an integration infrastructure, and offers strong alignment between business and IT objectives. It risks failure from improper scope, lack of coordinated corporate and IT commitment, and a poor understanding of BPM and BPMS concepts.

The top-down type of strategy is perhaps unique to BPMS as technology deployment goes. Initially, the top tiers of the selected business process hierarchy are implemented, with successively lower tiers implemented over time. The "backfilling" of detail need not be even across the entire business process, but may attend selectively to problem activities. It focuses on initial delivery of and acclimation to business process modeling, monitoring, analysis, and forecasting, with minimal reliance on technology integration. These capabilities are tools for business managers and business analysts rather than technologists. Monitoring may initially not be real-time or detailed. It will become more so as the process engine is used more extensively and business activities are eventually process-enabled through technology integration. Likewise, analysis and forecasts become increasingly more accurate. Even if the process engine provides only e-mail or Web services integration, tremendous process agility can still be obtained.

Managers use the BPMS (perhaps indirectly) to understand existing processes, measure current levels of performance, identify opportunities for process improvement, determine appropriate business performance metrics, and identify mission-critical technology integration objectives. Over time, the desired technology integration infrastructure is developed, or the existing infrastructure appropriately modified and integrated with the BPMS.

A top-down type of strategy offers fast deployment and almost immediate results for business managers. It risks failure from poor commitment to BPM principles by management, poor understanding of analysis and forecasting techniques (especially estimating and improving uncertainty), and an inability by IT to provide adequate, timely process integration.

Although the other strategies may each be appropriately used, only the top-down strategy type places priority on enabling business management practices from a process-centric view. With a top-down type of strategy, an end-to-end enterprise process can be chosen as the pilot. While this doesn't remove the so-called "adoption drag" (that is, slowing down adoption due to the mismatch between portions of the organization that are BPM-enabled and coupled portions that are not), it can help minimize the effect.

No matter which BPM implementation strategy type you choose, make sure it matches your abilities and objectives, and that it's compatible with the selected business processes. Then choose a compatible BPMS. Continuing BPM success comes from focused, process-centric attention to the business. **bij**

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# Straight-Through Processing for Customer Orders

## By Tony M. Brown

Nextel Mexico, a division of NII Holdings (formerly Nextel International) headquartered in Reston, VA, is a telecom company providing fully integrated wireless communications. The company operates in major Mexican cities, with each city operation connected to a centralized IT infrastructure containing billing, collections, provisioning, financials, inventory, and customer care systems. The company wanted to eliminate manual "swivel-chair" efforts that required the rekeying of customer information into various applications.

"Our users had to logon each time to use different operational systems—billing, financials, customer care—to process an order," explains Kiran Babu, chief architect, NII Holdings. "This meant that users had to manually enter data into different machines throughout the order fulfillment life cycle. We wanted to create one logical order process that was transparent to users."

### Process Orchestration

Nextel Mexico's goal was to reduce latency in the order fulfillment process and gain a single view of the company without replacing each back-end system that was already in place. It also required a flexible solution that was able to adopt any new process while providing automated run-time process versioning.

To accomplish the orchestration of integrated business processes, Nextel Mexico determined that a business process management (BPM) solution was needed. After carefully investigating the available solutions, it concluded that the FuegoBPM suite was the best technology choice.

The FuegoBPM suite orchestrates and automates Nextel's entire order fulfillment process, validates the customer order information, and automatically determines how data is routed to the variety of Nextel Mexico's systems required to activate a customer's wireless phone service.

"The FuegoBPM suite is a great concept. It is easy to use and cost-effective. With FuegoBPM, we didn't need to buy so many different components—it was an integrated suite that offered a better total cost of ownership," says Kiran. "FuegoBPM is flexible and easily integrates different systems and technologies, whether it is a legacy system or Java-based system. It is also very easy to design and review processes. Before FuegoBPM, designing a process consisted of drawing information flows on sheets of paper, which were then posted around a room and users called in to review the process. The BPM solution not only reduces the amount of meetings but it also makes the processes much easier to develop."

### Eliminating Manual Intervention

FuegoBPM allows Nextel to integrate and modify any system or business rule into the business process with minimal effort. The company is now able to have a common view of the process across all business areas that both business and IT can easily understand. The BPM solution has streamlined the sales, marketing, and customer activation (order fulfillment) process with a common, integrated process approach. The entire process is now simplified, efficient, and accurate. Nextel Mexico is also able to view relevant reports about its operations in as much or as little detail as desired.

Using FuegoBPM, Nextel Mexico has completely integrated the numerous manual steps necessary to enter customer information in the provisioning and activation systems. The order processing time from start to completion of an activated order has decreased by 16 percent as a result of BPM implementation. It has also resulted in cost savings of over $700,000 per year.

"FuegoBPM has allowed us to standardize and automate processes, reducing manual intervention and increasing order throughput," adds Kiran. "We want to expand the use of FuegoBPM to standardize more processes, especially for customer-facing systems. We aim to build more customer self-service capabilities (for example, allowing the customer to initiate and view orders), using an Internet browser and the FuegoBPM suite."

### Bottom Line

The FuegoBPM solution has automated and standardized key business processes within Nextel Mexico, leading to significant business benefits in order throughput and reduced costs. **bij**

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# Meeting the Challenge of Deregulation

## By Tony M. Brown

CenterPoint Energy (formerly the regulated operations of Reliant Energy) provides electricity transmission and distribution services for the Houston metropolitan area. As one of the largest combined electricity and natural gas delivery companies in the U.S., with nearly five million metered customers, CenterPoint Energy has assets totaling $21 billion and employs more than 11,000 people. It owns 12 power plants with more than 14,000 megawatts of power generation in Texas, of which nearly 3,000 megawatts are currently in mothball status, and maintains approximately 3,600 miles of transmission lines and more than 40,000 miles of distribution lines.

As a large utility, CenterPoint Energy has a complex IT infrastructure. Its data center, which includes four mainframe systems and 84 midrange servers, handles 89 million printed bills each year and more than 16,000 online reports. Its end-user operation consists of nearly 10,000 PCs, 500 servers, and more than 100 LANs.

### The Challenge of Deregulation

Prior to January 2002, CenterPoint Energy's business model had barely changed in nearly 120 years. As a fully integrated regulated utility, it generated power (and maintained reliability of service), delivered that power to its customers, read customers' meters, and collected payment.

Then in 2002, Texas Senate Bill 7 came into effect, deregulating the state's electric industry. The objective of the law is to let competitive markets work wherever possible and to regulate only those utilities that are true monopolies. Deregulation has affected the structure of the Texas electricity market. The seven delivery companies in Texas, of which CenterPoint Energy is one, provide transmission and distribution services, while competing retail electric providers market and sell the electricity to consumers. The Electric Reliability Council of Texas (ERCOT) administers the state's power grid and guarantees electric supplies for the entire state. It is paid for by all the delivery and retail companies.

"Deregulation forced us away from a totally integrated model," explains Mary Rich, IT manager at CenterPoint Energy. "Previously, when a consumer called, say, for a move-in, all the information would be entered into one legacy system, which would then be sent to the field. When the work was done, a message was sent back to the legacy system to update the information. For the consumer, there was only one company and one system to deal with."

Although deregulation was virtually transparent for the consumer (except that they now call one of the many retail providers competing for their business rather than being limited to a single local utility), it had huge implications for supply-side operations. "Now the same transaction hits more than 20 different computer systems, including those of the retailers and ERCOT," continues Rich. "Without ERCOT acting as the hub, every delivery company would have to ensure all their transaction types were compatible with every other market participant. There would have been chaos trying to get everyone on the same page talking the same language. So, when the Texas electricity market was deregulated, it was mandated that all usage transactions flow through ERCOT, which is responsible for settlement with the retailers, not the individual delivery company."

### Integration Issues

The far-reaching changes to the electricity market had a significant impact on the business processes and supporting technologies of CenterPoint Energy. "We needed a technology solution to help us do business in the deregulated energy market. Specifically, we needed to set up B2B communication with many other market participants, specifically the retailers and the ERCOT hub," adds Rich.

The Public Utility Commission, the regulatory body that oversaw deregulation, decided the industry needed a common transaction format, which would use EDI, be ANSI-compliant, and follow a set of standards protocols. In addition, business processes would follow a set of common terms and conditions. This created a challenge for many providers, including CenterPoint Energy. "We had to use EDI transactions to communicate with external parties but our legacy systems didn't natively handle EDI," continues Rich. "This meant there had to be translation between the EDI standards and our existing legacy systems."

For CenterPoint Energy to interface with multiple trading partners, it had to handle 26 different EDI messages—for invoices, usage data, payments, switch requests, move-ins, move-outs, service orders, and other business processes—and integrate these with its existing systems. And it would also have to do all these operations while handling its massive workload of over four million transactions per month. To meet these challenging requirements, CenterPoint Energy worked with both SeeBeyond and Accenture to architect a core B2B platform, which it called the Transaction Management Hub (TMH), to handle the necessary translation, validation, data transfer, legacy interfaces, business process rules, and reporting.

"A key challenge was the volume of transactions that needed to be translated—more than 300,000 per day," adds Rich. "We needed an integration solution that could scale for a massive volume of transactions, handle EDI formats, and perform the translation and validation. And it had to execute at the process level because there were a lot of business rules associated with each transaction. We used SeeBeyond because its integration solution could meet all our needs, and Accenture, our integration partner, had first-hand experience in working with

SeeBeyond's technology. We had also successfully used SeeBeyond with another system."

### Composite Application

Using SeeBeyond as its integration engine, the TMH acted as a centralized interface between business partners located throughout the deregulated marketplace and CenterPoint Energy's internal systems. These include large commercial and industrial customer systems, residential and small customer systems, and an outage system handling repairs and maintenance. The TMH utilizes a service-oriented architecture (SOA) to decouple the functionality and services provided by legacy applications from the new functionality and services provided through SeeBeyond and other business partners.

**Many states are watching the Texas model with interest. Deregulation has worked and it has been transparent to the consumer, while large industrial users are seeing substantial cost savings.**

Rich explains: "By placing all the business process rules into the integration layer, we can easily control what processing occurs with each transaction. There are a lot of complex business rules that mandate what needs to happen, depending on what transactions and which combinations of transactions are received."

"The SeeBeyond platform deconstructs incoming files into separate transactions, which it logs, verifies that they are legitimate, sends them to the appropriate legacy system for processing, and automatically sends an acknowledgement (or rejection notification) to the sender. It is the interface between our legacy systems and the market."

Early on in the project, CenterPoint Energy recognized that business processes embedded in monolithic applications are inflexible and difficult to change. By leveraging SeeBeyond's support for an SOA, the TMH externalized the business logic from disparate applications, creating new process-centric composite applications. Composite applications are driven by processes, defined by business rules, and determine if and when any human interaction is required. "We have one main business process that uses different services residing on different systems," says Rich. "We have externalized business logic in the middleware layer. Without SeeBeyond, we would have to write and update code for each legacy system. With SeeBeyond, we can respond much faster with lower risk because it saves programming, testing, and quality assurance. And we are now more flexible. It is so easy to add new trading partners."

### Window on the Market

CenterPoint Energy is in the process of upgrading to the SeeBeyond Integrated Composite Application Network (ICAN) Suite 5.0, which delivers a comprehensive, standards-based platform for the assembly of powerful, process-centric business applications from existing systems and infrastructure. By implementing ICAN 5.0, CenterPoint Energy will deliver more process visibility and control to business users, further reducing the amount of manual intervention.

Rich concludes: "SeeBeyond is our window to the outside market. It gives us the ability to communicate within the Texas deregulated electricity market and provides the flexibility for us to adapt as the market changes. It is our integration standard. It is like a beating heart at the core of our business operations."

Many states are watching the Texas model with interest. Deregulation has worked and it has been transparent to the consumer, while large industrial users are seeing substantial cost savings. And process-centric integration technology, such as SeeBeyond, has proved central to its success. **bij**

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# BPM: A Good Call for M&A

## By Tony M. Brown

Mergers and acquisitions are almost always a catalyst for change. And so it proved for a top-20 U.S. bank when it acquired the retail banking division of another major bank. Two major telebanking centers that handled more than three million customers had to be merged. This was a major task in itself, but the senior management at the bank also wanted the merged call center technology to be closely integrated with the customer transaction environment. This would provide end-to-end business visibility of the customer-facing processes and make them both more efficient and more effective.

### Business Goals

The bank had three key objectives regarding the acquisition:

- Make the conversion of the acquired institution transparent to customers
- Meet support requirements for its anticipated long-term growth
- Provide world-class customer service, regardless of growth or complexity.

To increase customer satisfaction of its service delivery and achieve these goals, the processes of the merged telebanking operations had to be improved. For expert advice and assistance, the bank turned to Piercetech, an experienced consultancy and integrator in call center and transaction environments.

### Technology Imperatives

To meet the bank's goals, Piercetech found there were several technology imperatives:

- Intimately linking call center processes with offline services and banking processes
- Allowing unified access to all customer data
- Implementing process control via business rules
- Monitoring and reporting of transactions from initial contact to completion
- Flowing work and tasks to individual agents and employees based on business events.

These imperatives could not be realized with the current IT infrastructure, which was not scalable or adequate to provide the required levels of customer service.

### The Solution

Achieving end-to-end business visibility meant that a CRM package, even one customized for the financial services industry, was inadequate. "Typical CRM solutions are focused on single-call resolutions," explains Mitch Pierce, CEO, Piercetech. "There is no notion of managing an end-to-end process in which there are multiple, long-running transactions that may be initiated by one call. There is no ability to close the loop. With this project, we had to provide visibility across processes running 140 different types of transactions that may involve both manual and automated tasks."

**Without the BPM-oriented solution, the bank would have probably lost customers—a high price to pay—and this may have jeopardized the success of the acquisition. Good BPM solutions can be that important for business.**

Piercetech needed to augment its GlobalFlow toolset, which moves and presents information when and wherever it is needed, with enhanced BPM capabilities from Ultimus. "We found Ultimus not only had powerful functionality but was very easy to use," comments Pierce. "Unlike many older workflow environments that have a heritage in imaging, the Ultimus solution is a transaction-oriented system, architected for Web services and built on .NET. We were able to quickly implement a scalable integration solution based on open standards. It reduced the costs and schedule of the whole project."

### The Benefits

Manual callbacks were virtually eliminated by the new BPM-based system. Previously, processes were often fragmented, with many steps requiring manual intervention. Calling back customers because of errors, or even lost transactions, accounted for nearly 10 percent of calls. These are now approaching zero.

Furthermore, the bank required accurate customer information in its back-end databases, but did not want any checks to occur during customer-facing processes, as this would have increased the time for all customer calls and decreased customer satisfaction. Business rules were used to verify that the data collected by call center agents was correct, in which case the databases could be updated. If there was a problem with the data, the workflow managed a task whereby the call agent made an outbound call back to the customer or involved other personnel, if required.

Overall, the BPM-based project reduced fulfillment time from 72 hours to 24 hours, reduced the average agent handling time by 10 seconds, and saved more than $500,000 in development costs. The payback period was just six months.

### Bottom Line

Without the BPM-oriented solution, the bank would have probably lost customers—a high price to pay—and this may have jeopardized the success of the acquisition. Good BPM solutions can be that important for business. **bij**

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# Legal Firm Expands Customer Base

## By Tony M. Brown

LexisNexis provides comprehensive and authoritative legal news, information, and tailored applications to lawyers across the U.S. Traditionally, the company focused much of its business efforts on attracting and retaining big law firms and large corporations with its legal information services. The company wanted to expand its services to the 80 percent of lawyers in small legal practices that did not have an easy or cost-effective way to access its services.

### The Business Opportunity

With increasing numbers of small law firms gaining access to the Internet, it was clear to LexisNexis that the Internet could expand its market to accommodate the needs of smaller firms. But there was a catch: Smaller law firms often worked to a faster timetable than larger firms and needed information immediately. To successfully penetrate the new market, LexisNexis had to improve its order fulfillment systems to provide the rapid response now required.

The IT department therefore set the following goals for the Small Law project:

- Establish a more nimble, flexible organization
- Dramatically improve customer-facing processes
- Fully integrate its vertical business silos.

### The Solution

To accelerate its order fulfillment system for the smaller law firms, LexisNexis integrated a business process management (BPM) system into its existing order fulfillment infrastructure. The BPM solution it selected was Intalio|n3, a standards-based, platform-neutral BPM solution that supports business processes that involve distributed transactions with packaged applications, databases, and legacy systems.

"Of the three BPM software providers we initially examined, Intalio offered the most immediate benefit without requiring us to purchase additional hardware or software," explains Allan McLaughlin, CIO. "It was also well-positioned to meet our longer-term direction for reducing the dependency on skilled software development labor required to keep pace with rapidly changing business processes."

LexisNexis' Web-based intranet fulfillment tool sends an order in a predefined XML schema over the corporate intranet to an Intalio|n3 server running on the Microsoft Windows 2000 operating system. The Intalio server consumes these orders, evaluates which of six possible decision pathways to take, and then branches toward various Intalio|n3 subprocesses. The various processes and subprocesses interface with a database (via a JDBC connector) to update order status and provide reporting. The Intalio|n3 server then sends the order to the existing back-office systems, and may generate an e-mail message to one or more parties, depending on the content of the data in the order.

"With Intalio|n3," adds McLaughlin, "We've established the BPM-driven middleware solution that is necessary to integrate various business systems that had, up until now, been stand-alone data silos. With Intalio|n3, we now have a way to integrate applications and data, and that's the key to the flexibility and adaptability that will further accelerate our responsiveness to changes in the business environment."

### The Benefits

The use of Intalio|n3 has enabled LexisNexis to decrease the amount of time it takes to fulfill an order by more than 95 percent—from 48 hours to two hours—and reduced the per-order processing costs. It enabled LexisNexis to realize its ROI in as little as four months.

"But those are not the only returns," says Terry Williams, project manager. "While project ROI has been substantial, the tight alignment that has resulted between our business and IT organizations has been even more significant. On the Small Law project, business and IT analysts worked side by side, modeling business process flows and then directly converting them into application source code. This alignment has paved the way for rapid action on future cost-cutting and revenue-generating opportunities."

As LexisNexis found, the ability to allow business users and software engineers to collaborate on the same underlying model and deploy processes that are executable on the company's existing infrastructure is a significant advantage of Intalio|n3.

LexisNexis has decreased the amount of time it takes to fulfill an order by more than 95 percent—from 48 hours to two hours—and reduced the per-order processing costs.

LexisNexis™
It's how you know™

### Bottom Line

Deploying a BPM solution has enabled a legal services company to rapidly expand its customer base, using new business processes that cross multiple organizations and systems. **bij**

Intalio|n3 is available from Intalio, Inc., 1900 South Norfolk, Ste. 290, San Mateo, CA 94403-1164. Voice: 650-577-4700; Website: www.intalio.com

FIRST IMPRESSION

By Tony M. Brown

# webMethods Delivers Business Process Optimization

The theory of business process optimization (BPO) may be simple and the rewards obvious, but the practice of achieving BPO is not. It requires an integrated business process management (BPM) and business activity monitoring (BAM) environment that can link information about business events from multiple systems. In other words, BPM + BAM = business process optimization.

BPM allows an organization to manage its business processes to create a competitive edge. Leading BPM solutions, such as the webMethods Integration Platform, overcome artificial boundaries of proprietary systems and span all enterprise processes, both inside and outside the enterprise. Critically, a BPM solution must also address the human element by integrating people directly into the processes to make decisions, according to business rule-driven workflows, and handle exceptions.

A leading BPM solution provides business information visibility and operational control across all aspects of an enterprise by:

- Integrating processes inside the enterprise and those of customers and partners
- Working with legacy applications, proprietary systems, and Web services
- Addressing human workflows
- Translating process definitions into new applications and integrations.

## Half the Solution

Yet, for a modern enterprise, BPM is only half the solution. True competitive advantage is only obtained when the enterprise can combine instantaneous awareness of events with the ability to correlate the information surrounding those events into meaningful feedback along the decision chain. A sustainable competitive advantage can be realized when this correlation capability extends to the point of recommending responses, to prevent failure or even to take advantage of an opportunity, before the events occur.

This is the point of BAM, which provides real-time visibility of operations, business processes, and transactions across the enterprise. A BAM solution should leverage the information visibility afforded by BPM to watch multiple systems for the occurrence of predefined circumstances (e.g., for a stock price or inventory to hit to a certain level) and then send out an alert that the condition has been detected. It also measures the efficiency and enhances the performance of business processes in real-time.

A leading BAM solution will:

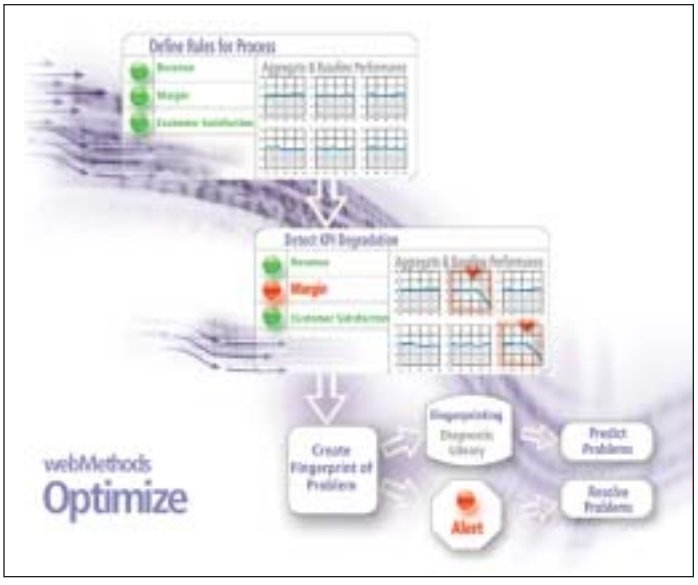
- Access and deliver information for the purpose of enhancing the performance of business operations
- Coordinate processes, measure their efficiency, and enhance or modify accordingly
- Notify everyone in the business process about predefined events
- Include all constituents: employees, customers, and partners.

While BPM provides the power to view and control business processes, BAM provides the intelligence to monitor and enhance the processes.

## Optimizing Business Processes

The goal of achieving business process optimization has been realized by webMethods with the addition of its core BAM product, webMethods Optimize, which provides instant insight into operational processes and customer transactions that span multiple disparate systems. By leveraging and extending the proven capabilities of the webMethods Integration Platform with the functionality offered by webMethods Optimize, customers obtain a viable business process optimization solution that measures the health of their business in a timely and relevant way.

webMethods Optimize is a BAM solution that harnesses the power of neural-network technology, allowing it to dynamically support real-time event collection, analysis, and correlation. Patent-pending fingerprinting technology automatically finds patterns in business processes and leverages this information to anticipate and diagnose problems before they can adversely impact business operations. It offers enterprises instant insight into operational processes and customer transactions, resulting in increased organizational efficiency and a positive impact on the bottom line.




## An Overview of webMethods Optimize

webMethods Optimize is designed to manage the three essential components of a successful BAM implementation: analytics, visualization, and prioritization:

- **Analytics:** webMethods Optimize pinpoints only the data relevant to an existing problem, isolates the problem to quickly resolve it, and then presents the information in business context.

This eliminates the confusing flood of information that forces managers to invest valuable time to identify problems on their own.

- **Visualization:** webMethods Optimize helps managers quickly and intuitively comprehend the problem and its associated causes. This shortens the recognition and response cycle, directly reducing the effect of the problem on the enterprise.
- **Prioritization:** webMethods Optimize provides managers with insight as to the relative impact of the problems at hand, allowing them to deal with the most critical problem first.

### How It Works

The Optimize life cycle has seven steps:

1. **Define:** The first step in the process is the definition of the key performance indicators (KPI) that are critical to the operation of the enterprise, along with the key metrics associated with each KPI. The KPI specifications are loaded into a rules engine along with user-defined performance targets for each metric. This information will be used as context when webMethods Optimize begins to compare actual performance to these key performance metrics in real-time.
2. **Access:** webMethods Optimize leverages the integration and data access capabilities of the webMethods Integration Platform to retrieve information about business processes in real-time. All IT assets are available to webMethods Optimize: custom applications, packaged applications, databases, and mainframe applications, as well as Web services.
3. **Listen:** Leveraging its real-time data access capabilities to monitor the transactions flowing through the business processes, webMethods Optimize captures the data comprising the transaction as well as the technical information surrounding the operational state of that transaction. This ability to tap into both business feeds and technical feeds is at the core of the BAM philosophy.
4. **Compare and analyze:** webMethods Optimize analyzes the metrics for a given KPI and stores the results in a sophisticated knowledge base that contains real-time and historical performance. This provides a baseline for the normal behavior of the underlying metrics and provides managers with a real-time view of business performance. Metrics can be displayed alongside other related data, or a user can explore a single metric summarized across any time period to more easily spot trends.
5. **Learn:** webMethods Optimize learns behavioral patterns—a "fingerprint"—that impact business goals, events, and activities. The fingerprint captures the status of the metrics associated with the KPI, along with information about the underlying infrastructure at the time of the event. These fingerprints are used to understand the underlying components that are important to the health of a business process and to predict and resolve future problems.
6. **Predict:** Over time, the fingerprinting analysis of webMethods Optimize learns behavioral patterns that affect KPI performance. These patterns are combined with the historical baselines of the knowledge base to provide predictive capabilities that actually forecast poor KPI performance before it happens. webMethods Optimize can actually alert managers to take corrective action before a problem occurs, eliminating any potential impact to the business.
7. **Recommend:** Some problems are systematic and often repeat. webMethods Optimize has the ability to recognize such problems by associating the symptoms related through the metrics to the knowledge base. webMethods Optimize can recommend diagnosis and treatment plans to resolve the problem quickly and accurately. As a result, companies can direct business spending toward instituting permanent corrective actions for the most frequent problem areas and, as a result, generate the most significant improvements.

### Optimizing the Business

Unlike many other BAM offerings that are based solely around dashboard functionality, webMethods Optimize is based on sophisticated correlation engine technology that correlates KPIs with the real-time data flowing through the business environment. It is able to leverage a Web services infrastructure to plug directly into critical business processes.

Together, the webMethods Integration Platform and webMethods Optimize offer a business process optimization solution that combines the ability of BPM to manage business processes with the advanced correlation and prediction capabilities of BAM. This has significant business benefits, including total information visibility, operational flexibility, and organizational agility.

All organizations can benefit from having improved visibility and control into their business processes. Business process optimization can directly influence customer satisfaction and retention, improve operational efficiency, and enhance the accuracy of financial reporting. The bottom line is that business process optimization has a direct, positive effect on business performance that will in turn have a direct, positive effect on the bottom line of the businesses that embrace this technology.

BPM allows an organization to manage its business processes to create a competitive edge. Leading BPM solutions, such as the webMethods Integration Platform, overcome artificial boundaries of proprietary systems and span all enterprise processes, both inside and outside the enterprise. Critically, a BPM solution must also address the human element by integrating people directly into the processes to make decisions, according to business rule-driven workflows, and handle exceptions. **bij**

webMethods Optimize is available from webMethods, Inc., 3930 Pender Drive, Fairfax, VA 22030; Voice: 703-460-2500; Website: www.webmethods.com

webMethods®

# Process Visibility: The Key to Customer Service

## By Tony M. Brown

Pulte Mortgage is a wholly owned subsidiary of Pulte Homes, one of the largest homebuilders in the U.S. It strives to meet the financing needs of customers by providing excellent customer service and comprehensive loan options.

"Most people make several major decisions in life. Pulte is involved with two of them," says Rod Hardin, CIO and senior vice president of IT at Pulte Mortgage. "One is buying a quality home; the second is properly financing it. Pulte is building more and more homes and we are providing more and more mortgages. Our whole ethos is built around customer service."

Experiencing rapid growth, Pulte Mortgage wanted to maintain its enviable record of high customer satisfaction. To achieve this, the company established a corporate initiative to identify ways to be more responsive to customer requests and keep its customers more informed and prepared throughout the mortgage-lending process.

### Excellence in Customer Service

To help meet this objective, the company conducted a vendor review to find a BPM solution that would increase its visibility into process performance, provide more control over process changes, and reduce the time taken to process an end-to-end loan application.

"Our mortgage applications are fine at performing the necessary calculations and operations to generate documentation for the customer loan file, which can comprise more than 300 different documents," explains Hardin. "However, they do not measure critical events and track progress against a set of key performance metrics. We needed an enterprise process management solution that could help us improve customer service and operational efficiency. It had to be a separate component from the business application so we could switch out any application with minimum disruption. We realized we were never going to 'slay the paper dragon' by waiting for a mortgage application provider to incorporate the BPM function we needed."

With customer satisfaction already high, Pulte wanted end-to-end visibility of its processes to make the adjustments that would further increase this metric. "We wanted to improve customer satisfaction from 83 percent to 90 percent and save up to $5 million in costs," adds Hardin. "Our overriding goal is to drive our customer services scores as high as possible, and technology is a key component in helping us achieve this."

### Making the Team Work

Pulte found that many BPM and workflow products were high-end and expensive middleware solutions built on an EAI layer. The company wanted something less costly. It was also clear that it did not need to re-engineer processes. "We investigated workflow for customer services and operational efficiency. We wanted to standardize customer-facing processes. We did not want to re-engineer our processes—we had already done this over the previous five years. We wanted to measure the performance of our existing processes, especially those that touch the customer, and improve them, if necessary."

Pulte found one solution that met its needs: Lombardi's TeamWorks, an enterprise-scale BPM solution designed to deliver continuous process improvement. Managing and adapting processes within a changing business environment, TeamWorks enables companies to continuously measure and incrementally improve processes, helping to leverage value from their business processes and maximize operational efficiencies. Lombardi's BPM software also increases the visibility that organizations have into process performance and correlates it with business impact. Both of these

characteristics were important to Pulte, which required the capability to provide detailed process information throughout the enterprise and allow business users to continuously change processes in response to evolving market conditions.

Pulte was also attracted to Lombardi because of its cost-effectiveness. TeamWorks leverages existing investments in systems, skills, and training. It is an open platform, using J2EE and XML standards, and is completely interoperable with Microsoft .NET systems.

### Business Activity Monitoring

The primary role of Business Activity Monitoring (BAM) is to track critical business events in real-time and alert users of a potential problem before it becomes a real one. The Lombardi solution provides BAM-like capabilities because it monitors critical-path events, allowing Pulte to continuously improve its processes.

The solution provides managers and executives with highly detailed Process Scoreboards to keep them informed of process and team performance.

At Pulte, TeamWorks tracks nearly 40 key milestones throughout the process, from origination to post-close for more than 1,500 existing loan applications. This provides Pulte with visibility into the entire lending process and the ability to track critical-path events in near real-time. Prior to the Lombardi solution, tracking had been post-facto reporting.

The solution provides managers and executives with highly detailed Process Scoreboards to keep them informed of process and team performance. Scoreboards are equipped for "drill-down" views that enable users to immediately access detailed process information.

### Paving the Critical Path

Unlike the traditional BAM concept, Lombardi's BPM solution is not executing the loan process—it is providing insight into the end-to-end process. But that is not all it does. TeamWorks includes Process Coaches that guide users through process tasks, delivering key information from underlying applications, along with detailed instructions to ensure consistent process execution across the enterprise. Additionally, the TeamWorks Task Manager contains detailed information about process status and keeps users informed of pending tasks.

"Lombardi's TeamWorks is a great product," says Hardin. "We have built more than 20 dashboards to provide end-to-end process visibility. It helps to coach a user through a particular task. TeamWorks also retains the knowledge of our corporate processes, so we can train new employees more easily and quickly."

With Lombardi tracking nearly 40 business events on the critical path to get a loan closed and keep the customer informed, it is standardizing key processes and smoothing customer-facing operations. Faster handoffs occur throughout the loan process. "We expect to see significant cost savings from higher throughput—a direct result of increased business visibility. In the past, users had to assess what tasks had to be undertaken for a particular customer by physically examining the loan file. Now, the workflow solution provides a task list of what needs to be done. We have moved from a reactive system to a proactive one."

Customer satisfaction is improved throughout the entire process. TeamWorks notifies loan officers of important dates, and sends an e-mail when it's appropriate to contact the customer. For instance, users now receive e-mails as the loan is closing, prompting them to contact the customer for a document review to ensure everything is in order and that the customer is prepared for the close.

### Slaying the Paper Dragon

As a company, Pulte Mortgage has three business objectives:

- Increase operational efficiency: Being efficient is essential to providing excellent customer service.
- Develop personnel: Highly trained and proactive staff is another critical success factor for customer satisfaction.
- Maintain growth: Currently, Pulte is growing at an accelerated pace, year-over-year. Although an internal business metric, growth is often an inhibitor to better customer service when a company cannot scale its customer-facing operations sufficiently as it grows. Pulte is committed to delivering better services for its customers while increasing value for its shareholders.

Lombardi's TeamWorks is helping Pulte achieve all three business objectives. It is also a central element of future plans to further increase customer service levels by decreasing the vast paper chain. Hardin concludes: "Lombardi TeamWorks has helped standardize our processes. As we build more processes around TeamWorks, I fully expect it to become strategic to our business. In fact, we hope to use Lombardi in the future to help slay the paper dragon." **bij**

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# Plain Sailing With Workflow

## By Tony M. Brown

Stolt-Nielsen is one of the world's leading providers of transportation services for bulk liquid chemicals, edible oils, acids, and other specialty liquids. Through its parcel tanker, tank container, terminal, rail and barge services, the company provides integrated transportation for its customers. It wanted to centralize and automate its accounts payable processes in a Houston-based accounting services center that would support operations for more than 20 locations worldwide, saving 15 percent in accounting labor costs.

### A Problem of Complexity

Although simple enough in concept, in reality this was far harder to achieve because of the complexity of the business operations that needed to be supported. Stolt-Nielsen manages 250 companies, in 24 offices, across six continents, using 16 functional currencies and any of 60 transaction currencies. It processes about 180,000 invoices annually, and a typical invoice can contain 100 pages of documentation.

"Our agents submit all activity on one invoice, although it involves separate processes such as insurance, ship management, and port disbursement," says Mickey Stayman, business systems manager at Stolt-Nielsen. "These processes are handled by different groups—sometimes in different continents. We had to fax paperwork all over the place so the approvers could see all relevant documents."

### The Workflow Solution

The company decided to implement a single global document management repository where accounts payable clerks could store invoice images and supporting documentation and then easily route them for review and approval to supervisors anywhere in the world. Workflow was a critical component of the solution to allow users to see invoices and route them through the approval process, even when they were out of the office, without having to deal with paper copies. Accounts payable clerks in Houston, for example, could scan and submit invoices for approval by supervisors in Rotterdam.

"We researched a large number of vendors. Many of the products could not meet our requirements," comments Stayman. "Hummingbird, the provider of our document management system, recommended BizFlow Accelerator for Accounts Payable (AP) from HandySoft because it could handle complex workflows and intelligently route work items between processes and subprocesses."

BizFlow Accelerator for AP enables the integration of current AP systems and processes into a unified solution that tracks payables from submission to payment, auto-pays routine invoices, handles exceptions that require human attention, and generates reports on the status of invoices in the approval and payment process. It offers straight-through processing of payments, according to definable business rules, and automates exception-handling for routing of invoices for review, approval, and payment.

"Before, there was too much inefficiency and risk of losing documents when routing documents physically to different locations for approval," continues Stayman. "We could even lose track of documents, which would lead to delays. Now we have total control of the approval process."

Previously, staff had to rekey information from paper-based invoices into the ERP system. With BizFlow, the invoices are electronically loaded into the ERP system without human intervention, increasing both throughput and data integrity.

### Following the Business Rules

As well as reaping cost savings due to the centralization of the accounting function, Stolt-Nielsen has also reduced invoice cycle times by as much as 85 percent, reduced outstanding payables, and can take advantage of early-pay discounts.

But there were some unexpected benefits. When the new system went live, the company found the number of escalated invoices had increased, even though the volume of invoices was the same. It was discovered that the company's formal approval policy had not been adhered to in all cases prior to using BizFlow. It is a great example of how increased business visibility can lead to unanticipated process improvements and business benefit.

### Bottom Line

Deploying the workflow and document management solution has increased control and efficiency while decreasing risk. Stayman concludes: "BizFlow was integral to our business strategy of centralizing the accounting function. It would have been impossible to undertake this project without the capabilities of BizFlow." **bij**


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# Salvation From Data Hell

## By Tony M. Brown

Important decisions need to be made. Management of the healthcare company has reviewed volumes of business metrics and data about patient trends in its facilities. However, to be more certain of the proposed action, they ask to see the same data cross-referenced in different ways, against different metrics. It's such a simple request, but it requires a programmer to extract the information from the data warehouse. Real-time visibility into its business processes and metrics is sorely missing.

### Data Hell

This is not fiction, but an all-too familiar scenario for healthcare organizations like Shands HealthCare, a hospital system affiliated with the University of Florida. "One might say we were in data hell," says Gigi Lipori, assistant to the executive vice president and COO. "We would analyze key business data and then realize we needed a different view of the same data. But this was never executed in real-time, so we often found ourselves creating reports, while managers had to hypothesize until the actual data was obtained."

Shands had a comprehensive data warehouse that had been maintained for more than 20 years, but those who needed it to make decisions could not access the data interactively. Retrieving the data and performing the required analysis fell to a small team of technology specialists. This created a problem. "A handful of programmers would access the data based on management requests. The difficulty was that demand always exceeded supply, and there was always a queue of requests for data, and turnaround times were often delayed," adds Lipori.

### Decision Life-Support

Rather than be on virtual decision life-support, Shands wanted to provide decision support tools for its executive and management teams. "We wanted to create a decision support system to allow management to become more data-driven, to make decisions based on hard facts," explains Lipori. To enable administrators and executive managers to track, understand, and manage financial, regional, staff, and patient information, Shands HealthCare installed BusinessObjects Enterprise 6, a leading business intelligence (BI) platform.

Shands HealthCare

An integral part of BusinessObjects Enterprise 6 is BusinessObjects Dashboard Manager, which Shands is using to continue the development of its powerful BI dashboard to give staff immediate access to financial data as well as patient and staff trends. Administrators will be able to see the various relationships that exist among medical services, facilities, doctors, staff, and patient volumes and understand how these affect revenue. For example, an administrator could be automatically alerted to any significant increase in the length of hospital stays and could associate it to a facility, procedure, physician, or type of patient.

> We have created a powerful semantic layer between the user and the application to make sure there are no mistakes with the data inquiries . . .

### Interactive Dashboard

Many of Shands' executives and administrators can immediately track, understand, and manage information over the intranet, enabling the company to control costs more effectively and improve patient care. "We have created a powerful semantic layer between the user and the application to make sure there are no mistakes with the data inquiries," comments Lipori. "Our dashboard allows users to get at the mainframe data themselves and it is interactive. It has empowered users, allowing them to get the data they need to make better decisions, which has helped us improve clinical decisions, patient throughput, financial management, and patient experience. We no longer have to wait for reports to try to identify and respond to issues, and the dashboard has become an integral part of our success."

### Bottom Line

By using business intelligence software from Business Objects, a healthcare provider was able to gain better insight into the performance of its processes. **bij**

Business Objects Enterprise 6 is available from Business Objects, 303 Orchard Pkwy., San Jose, CA 95134. Voice: 800-877-2340; Website: www.businessobjects.com

# Eliminating the Paper Chain for Home Loans

By Tony M. Brown

Accredited Home Lenders is a nationwide mortgage banking company that originates, finances, sells, securitizes, and services non-prime mortgages for single-family residences. The company is growing rapidly and has established itself as one of the country's most respected non-prime lenders. During 2003, Accredited originated $8 billion in mortgages through its wholesale and retail channels.

**Deploying a BPM system has helped Accredited process more of its loan applications "straight through"—significantly reducing the costs and risks of human intervention.**

### Business Process Challenge

The mortgage industry has traditionally been reliant on enormous quantities of paper. Every step of the mortgage process, from origination to funding to servicing, requires many forms. The burdensome, paper-based processes diminish profit margins and slow growth because of:

- **Increased costs:** Extra headcount is required simply to rekey data, collate, and file.
- **Reduced transaction volume:** Inefficient information sharing between a mortgage company and its partners in the mortgage process (e.g., brokers and credit bureaus) limits the number of transactions that can be completed in a given amount of time.
- **Increased risk:** Mean time-to-close, an indicator of the time required to process mortgage applications, is extended.

Accredited wanted to automate the loan life cycle, simplifying and accelerating human intervention wherever possible. The first move was to bring in Atlanta-based WellFound Technology, an IT solutions provider that helps companies streamline processes and access crucial business data and services in real-time. Its domain expertise in mortgage banking has resulted in a Mortgage Integration Framework (MIF), a service-oriented, architecture-based solution that utilizes standards-based technologies to enable mortgage bankers to integrate an entire value chain.

### Mortgage Integration Framework

MIF is built on BEA WebLogic Platform 8.1, which includes WebLogic Integration, WebLogic Portal, WebLogic Server, and WebLogic Workshop. MIF also incorporates a common data representation (CDR) schema that complies with the new MISMO (Mortgage Industry Standards Maintenance Organization) XML standard—a data schema that allows mortgage bankers and other companies involved in the mortgage process to exchange data in a consistent, predictable manner.

WebLogic Integration provides an integration layer that is designed to enable Accredited to loosely couple new and existing applications via Web services. WebLogic Integration also provides a business process management (BPM) capability to orchestrate activities by routing messages reliably and alerting appropriate personnel when their action or attention is required, according to specific business rules. It is able to both model and execute business processes in one environment, allowing Accredited to design and implement workflows that mirror the needs of the business.

WebLogic Portal provides the interface for registered users to receive a real-time view of where loans are in the process, and be alerted to events that need their attention. Users get access to both individual loan information and an aggregated view of loan activity relevant to them. The portal utilizes several portlets to present information. Examples of portlets include a view into the loan pipeline with drill-down access that provides visibility into the status of pending loans and performance of individual brokers, real-time news feeds, and event-message registration that enables users to select the type of alerts they wish to receive.

Accredited is also leveraging WebLogic Portal's native content management capabilities to publish content to the portal and tailor the services and information that are available to each

user. Content for each registered user is determined by business rules related to job title, job responsibility, and other variables. Accredited's new portal is initially being rolled out to employees, with plans to roll it out to brokers after a successful internal deployment.

### Integrating Java and .NET

Accredited utilized WebLogic Workshop, a core component of the BEA platform, in implementing MIF. WebLogic Workshop is an integrated development environment that enables any developer— even those new to Java— to build service-oriented Web applications and Web services. Accredited has been a Microsoft .NET shop for years, but putting development on hold while the entire IT staff was retrained on Java was simply not feasible, due to the cost and time of such an undertaking. WebLogic Workshop made it possible for Accredited to start leveraging Java for mission-critical applications incrementally and while leveraging existing in-house development talent.

WebLogic Workshop removes the complexity from J2EE development and provides software developers with an intuitive visual development environment so they can build Web applications rapidly without having to understand the complexities of Java. Many developers on the Accredited staff were able to become proficient with WebLogic Workshop in two to three weeks despite having no Java experience.

"WebLogic Workshop enabled us to utilize the BEA platform," says Jim Pathman, CIO at Accredited. "We wanted to move to Java and, based on the recommendation provided by WellFound as well as our own research, we determined that BEA provided the best Java foundation for us. However, we have years of work invested in .NET. We couldn't just dump the platform. We wanted to extend that investment."

Mike McCoy, director of enterprise architecture, adds, "BEA allows us to do that by enabling us to integrate .NET applications with our new Java-based applications, and by enabling our staff to get up to speed on Java fast. Now, we have the flexibility and enterprise-class strength of Java, and we continue to leverage our .NET investment via the interoperability provided by WebLogic Workshop's Web services. We have the best of both worlds."

"We need to build systems and processes that can match our growth and adapt to change," says Pathman. "We knew we wanted a standards-based solution for integration, and WellFound Technology tied it together for us into a services-oriented architecture. As a result, we now have an enterprisewide integration framework that can meet today's needs and quickly respond to our ever-changing business processes."

### Focusing on the Business

The MIF is now in place. The initial phase of the project was completed on time and on budget, and WellFound and Accredited are continuously rolling out new service-oriented applications. Among the first projects to be completed were a loan gateway that provides drill-down access to loans in progress that require special attention, and integration between MIF and Accredited's legacy funding and underwriting applications.

An alerting application has also been implemented on MIF. It is specifically intended to shorten mean time-to-close by generating real-time messages whenever a loan application is idle, pending human action. Alerts can be sent to mobile phones, e-mail accounts, and instant message accounts. Additional workflow automation and process optimization that are in the planning stages are designed to further increase loan processing efficiency so that Accredited can close more loans, faster, without increasing headcount.

"The benefits of our new infrastructure are pretty straightforward," says Pathman. "From an IT perspective, we can build and integrate services faster and cheaper. From a business perspective, we want to improve the quality of our work product by eliminating the need to rekey data, improving accuracy, reducing overhead, and enabling faster, better lending decisions. That will make us a more attractive lender to independent brokers, which is one of the keys to growing loan originations and staying ahead of the competition."

"I would sum up our new infrastructure by saying that it allows our developers to add more value by focusing on business logic without having to reinvent the wheel on each project," adds McCoy. "We have fewer worries about security, integration, presentation, and so many other tasks that we used to incorporate into every development project. As a result, we can bring new applications to market much faster, and we're more responsive to the needs of our brokers and other partners."

Pathman concludes: "The WebLogic Platform is a standards-based business integration technology that allows us to extend our investment in existing IT resources. Of great interest to us is BEA's approach that blends traditional integration tools, such as BPM modeling and graphical transformation, with custom SOA development in one package for building next-generation composite applications. This convergence of BPM and SOA development is paramount to our goal of building a services-based IT architecture: it enables faster development and delivery of new applications, and helps Accredited stay ahead of the competition. BEA is a true strategic technology partner for Accredited; together with our vision and their technology platform, we are able to align IT with the demands of our business," concludes Pathman.

### Bottom Line

Deploying a BPM system has helped Accredited process more of its loan applications "straight through"—significantly reducing the costs and risks of human intervention. **bij**

These products are available from BEA Systems, Inc., 2315 North First Street, San Jose, CA 95131. Voice: 408-570-8000; Website: www.bea.com

# BPM Enables e-Government

## By Tony M. Brown

The Missouri Public Service Commission (MPSC) regulates more than 1,400 utility companies operating in Missouri, including electric, natural gas, telephone, water, and sewer companies. The MPSC has a clear mission: To ensure "safe, reliable, and reasonably priced utility services" for consumers while allowing investors "the opportunity for a fair return." For example, if a telecommunications company requests approval for a rate hike, the MPSC would thoroughly evaluate the request at all levels to ensure it was fair before bringing the case to a judge for review.

### A Paper Mountain

Some of the companies policed are large, multinational telecommunications concerns. Others are small, local, family-owned sewage treatment firms. The MPSC also provides services for more than 5 million Missouri citizens, such as rate inquiries or filing complaints. It is a complex regulatory environment that generates a huge volume of information—by the late '90s the MPSC had 9 million hard copy documents on file. Tracking, processing, and filing documents consumed a substantial amount of resources, especially as its case management system was antiquated. All communication was done either by paper documents, fax, or internal mail. These documents were stored in filing cabinets dispersed across 10 floors. Finding a document was a labor-intensive and time-consuming process.

The manual processing of documents and associated copies was highly error-prone, since the process could stall at any step and there was no simple way to track status. Version control was largely down to the memory of the individual employee.

### Catalyst for Change

Enter utility deregulation, which meant the already heavy workload was expected to grow by at least 20 percent per year. Increasing the number of staff was not an option—the MPSC was tasked to continue its work with a fixed head count. The commission faced a difficult future, as the workload would quickly overwhelm the capacity of the workforce and processes. "The 1996 Telecommunications Act, which encouraged more competition, would lead to a steep increase in the number of cases but without the opportunity for more head count," says Todd Craig, the IS manager at the MPSC. "Resolving cases would take far longer. Our strategic plan was to get more information out to the public and reduce the cost per case. Deregulation was a catalyst for change."

The only way forward for the MPSC was through technology-led business productivity gains. "The problem was that our four legacy systems were twilight systems," Craig continues. "We had a classic stovepipe environment. For example, the tariff system would not talk to the case system. This meant we had to resort to manual entry of data into multiple systems, and to have instant access to the cases we had to have multiple filings of documents. The utility companies had to file up to 14 copies of each submission. There was no integration of documents to dockets (a summary of the activities, actions, and calendar for a case). Dockets had to be printed and then the case documents of interest had to be physically located."

Not surprisingly, metrics and reports of the processes were difficult to obtain, if they could be obtained at all. And rate payers had poor and inconvenient access to rate and service information.

### The Solution

The MPSC concluded that an automated Business Process Management (BPM) system would eliminate paper, slash request response time, and generate a significant ROI. The goal was a Web portal, both for business and consumer clients, which would carry most of the workload. However, it was recognized that not all cases would go online and

**By using the portal, the number of required hardcopies has been reduced from 14 to just five. We can now monitor processes and make changes to the workflows on demand.**

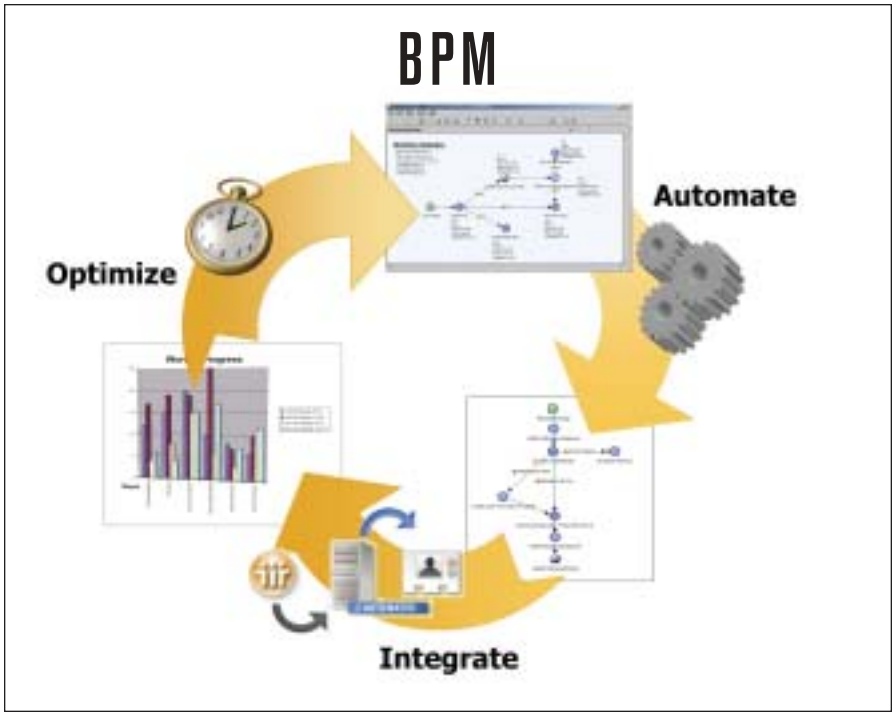
about 20 percent would remain paper-based. In these cases, imaging services would convert documents into an electronic format for access into business process management.

Craig explains: "For our electronic filing and information system, we required a robust and scalable workflow engine. We looked at integration technologies, document management solutions, and content management products. The only inclusive solution that offered BPM, along with document image management and content management, was FileNet BPM."

The FileNet platform stores original document images and text content in a central repository. From this, the solution generates more than 40 technical, management, and legal reports. The application is composed of approximately 350 front-end screens, 200 back-end database tables, and 50 XML-based, e-process workflow maps for automatically moving the work and the associated documents through the process life cycle.

After an extensive pilot run, the system went live in mid-May 2002. Applications can be filed over the Web, using a browser to access a customized Web portal. The system allows for the filing of paper forms, as well as for the uploading of electronic documents. All types of utilities and filings can be selected from drop-down boxes.

"FileNet BPM integrated our major systems," adds Craig. "The collaborative system offers secure access by staff, utility companies, and ratepayers. Staff can simply click on a line item in a docket to see the associated document. By using the portal, the number of required hardcopies has been reduced from 14 to just five. We can now monitor processes and make changes to the workflows on demand."




### The Results

The results have been impressive:

- **Number of business processes:** Reduced from 158 to 60 (the 98 redundant processes were largely workarounds due to incompatible technology).
- **Number of integrated processes:** Increased from 22 percent to 100 percent. All 60 business processes can now interact with each other.
- **Number of systems:** Reduced from 64 applications to 10.
- **Documents on file:** Reduced from 9.2 million pages to 5 million pages. This figure will reduce further as documents can be released after retention periods expire.
- **Document growth:** Reduced from 1.2 million new pages added annually to 200,000—an 83 percent reduction in the growth of the paper mountain.

As a result, employees have been saving an average of an hour and a half from their schedule each day. This has yielded a productivity gain of $2 million per year. Direct cost savings have also been impressive. Reduced printing and delivery costs save $275,000 each year.

MSPC has met its strategic goal of making its business processes more effective to mitigate the increasing workload. But the commission is not the only party to benefit from the BPM solution:

Regulated utility companies see reduced costs of doing business with MPSC. One utility, a large international telecommunications company, claimed in one month alone to have saved 40 staff hours and eliminated production and delivery fees for nearly 4,500 pages of paper. Companies also enjoy secure and efficient interaction with MPSC to receive faster, better quality decisions. Inquiries can now be dealt with almost immediately, instead of waiting days or weeks.

Rate payers can access online information, enabling them to make educated decisions regarding utility services (e.g., best-buy decisions). They can also view the status of a request online.

### The Bottom Line

The MPSC was the first state utility agency to deploy an electronic filing and information system. It is a showcase, both for the benefits of e-government at the state level and the power of BPM solutions. Craig concludes: "FileNet BPM is the foundation of the entire solution. Without it we would be in a world of hurt! We would have to figure out how to survive, given the current workload and business environment. It would not be easy." **bij**

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# Business Rules OK?

## By Tony M. Brown

Balboa Insurance Group, a subsidiary of Countrywide Financial Corp., is one of the largest vendors of insurance-tracking services in the U.S. for mortgage companies, banks, and other financial institutions. These organizations work with Balboa when they need to verify that customers have enough insurance to protect the lender's interest in the collateral. When a borrower does not have adequate insurance, Balboa provides a service that enables the lender to purchase insurance on behalf of the borrower.

Balboa deals with huge volumes of data. On average, Balboa tracks information for approximately 10 million loans, many of them mortgage loans. Each day, the company handles about 100,000 inbound documents from hundreds of insurance carriers. These documents arrive via fax, mail, and electronic data interchange.

### Poor Business Visibility

Over the years, Balboa deployed a number of workflow in-house applications to handle this high-volume flow of information. "The business rules were encapsulated in a COBOL-based program," explains Mike MacKenzie, senior vice president of application development, Balboa Insurance. "It was functional but not very flexible. Users had no visibility of the business rules and it was difficult to change them."

Balboa Insurance recognized the need to upgrade its processing systems to remain competitive and continue providing superior service to its large customer base. The company also wanted to maintain an accurate and efficient flow of information between its own systems and those of its corporate clients. Specifically, it needed to:

- Increase the performance of data exchange to and from client systems
- Share and customize business rules with its customers
- Automate document processing tasks, reducing the need for human intervention.

MacKenzie adds: "We required better integration with our customers' lending systems. Our primary goals were to update the lending systems in near real-time and to have a single system of record—the lender's system—eliminating the need for a shadowing system or a dual posting system."

### Flexible Business Rules

Balboa developed TrackSource, which integrates its own processes directly with the loan systems of its customers. The IT department at Balboa wanted to leverage a comprehensive integration platform and a powerful business rules engine. After looking at several options, it selected Microsoft BizTalk Server 2004, part of the Microsoft Windows Server System.

"TrackSource is core to our business and represents a substantial investment by the company," explains MacKenzie. "BizTalk was attractive to us because it offered a rules engine coupled with integration capabilities. By offering two technologies we needed in one package, BizTalk helped reduce our costs."

TrackSource leverages the business rules capabilities of BizTalk Server. It provides Balboa with an intuitive method of separating implementation details from the business logic. Business processes are designed using BizTalk Server objects created with the Microsoft Visual Studio .NET 2003 development system. Information coming into Balboa—as well as data that is returned to the customer host databases—is controlled by a combination of BizTalk Server evaluations and outcomes based on rules-engine execution.

"As insurance documents come into Balboa, we route them through BizTalk Server for processing, matching each document to the appropriate loan," says MacKenzie. "Once a document is matched to the proper account, we are able to interface with the lender in real-time to get the current information on the loan's status. From that point, we pass data from the incoming document along with information from the loan and run it through the BizTalk Server rules engine to make a decision on how to proceed with the document."

After a document is accepted into the system and a BizTalk Server orchestration helps to validate it, the transaction continues or the Balboa database flags it as an exception, in which case, an exception analyst takes over to correct the document manually.

> Being able to integrate with our client systems in a faster, more efficient way than before is crucial to the success of this project.

TrackSource has its own operational data store that uses Microsoft SQL Server, also part of the Microsoft Windows Server System. TrackSource searches and matches against lender data, which is updated regularly. When TrackSource finishes processing a document or transaction, it accesses a lender's host system—typically by accessing a mainframe or minicomputer through a "green-screen," text-based terminal using host emulation middleware—and updates the host system using the same middleware components.

### Reaping the Benefits

With the new solution, Balboa can exchange data much more efficiently

with the systems of its customers. This has improved customer service. "Being able to integrate with our client systems in a faster, more efficient way than before is crucial to the success of this project," says MacKenzie. "Through this integration process, we are able to post data directly to the lender's system of record. If the lender gets a call from a customer, the information is already in their system. This means that we serve them better, and they can provide better service to their customers.

"BizTalk Server, with its use of XML, enables us to integrate with client systems in whatever way is available," MacKenzie continues. "They may be using other commercial applications or have their own application programming interfaces. As soon as we receive their data, it is translated into XML, so that we can handle it internally. Now, if we want to add a new client system, we just need an adapter and the rest of the system works."

BizTalk has significantly improved the process visibility for business users at both Balboa and its customers. "Before, when we made a change to one business rule, we had to be very careful it did not impact other rules. With BizTalk, the rules are now English-like and can be easily understood by business users. This means we can share rules with our clients and even add a new rule just for that client."

The reliability of BizTalk Server ensures a high success rate for the transactions passing between Balboa and its corporate clients, according to MacKenzie. "BizTalk Server has proven very reliable," he says. "Even if we unplug a server and it goes down, it's able to recover any transaction that was in process." MacKenzie adds that the company will be able to easily scale up BizTalk Server in much the same manner as adding Web servers, giving Balboa a cost-effective means of growing the system in accordance with business needs.


### Working With BizTalk

"We compare using BizTalk Server 2004 with a subway system," comments MacKenzie. "Once you've created the connections to each stop in the system, whether it be a fax server, our optical character recognition system, or our client lending systems, the transactions pass through like trains on a track and can be routed to any stop based on the business rules."

TrackSource is a newly developed application that went into production early in 2004. MacKenzie explains that Balboa intends to take advantage of other features of BizTalk, such as its Business Activity Monitoring (BAM) capabilities. "We have high hopes for BAM. We are attracted to having zero-latency analysis of the entire system so we can measure throughput, track the transaction paths through the processes, and be alerted to bottlenecks. For example, we can set minimum and maximum thresholds for the number of faxes coming through the fax server. If they are reached, we can alert users to potential problems, shift resources, and continue to meet service standards."

BALBOA
Insurance Group

### Bottom Line

MacKenzie concludes: "TrackSource gives us an industry-leading application that processes transactions directly to our client systems. We can now share and customize business rules quickly with our clients. BizTalk has really helped us strengthen our customer service and make us agile." **bij**

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# Workflow Incorporated

## By Tony M. Brown

Workflow is a crucial component of collaborative applications. For independent software vendors (ISVs) and enterprises that are developing collaborative applications, it makes sense to embed a comprehensive and customizable workflow engine into these solutions. This was the approach adopted by California-based software provider diCarta when it wanted to enhance diCarta Contracts, its enterprise contract management solution. The solution helps companies gain control over their contract management procedures, increase visibility into contractual obligations, and drive contract compliance.

### The Workflow Advantage

"Workflow is important because it is such an integral component of the contract management process," says Bob Jamison, director of product management at diCarta. "When a contract clause needs to be modified from standard language or a key business term is not in line with company policy, then it is important that the right people in the organization review and approve these proposed changes before the contract is executed. We also need workflow in managing contract compliance."

diCarta had three key requirements for enhanced workflow capabilities:

- **Enterprise scalability:** diCarta Contracts is deployed in some of the world's largest, most contract-intensive companies, so the workflow solution needed to match diCarta Contract's scalability.
- **Graphical representation:** A graphical view of the workflow allows a user to easily understand the status of a particular work item (i.e., a contract) within the overall process.
- **Parallel workflow:** This allows multiple workflow threads (say within different departments) to run concurrently, which was critical, as most diCarta clients are large Global 2000 enterprises that require complex workflows.

The question was: buy or build?

### Buy vs. Build

diCarta searched the market for a robust workflow engine it could easily incorporate into diCarta Contracts. In the end, one company had a solution that met its needs: Dralasoft. "It was a straightforward build vs. buy decision," explains Jamison. "We looked at the level of effort to build our requirements and we concluded it was better to leverage Dralasoft Workflow. This significantly accelerated time-to-market and resulted in richer functionality than our product would have had if we had built it ourselves."

ISVs and some end-user organizations need an enterprise-class workflow engine that can easily be incorporated within an application.

Dralasoft creates standards-based workflow technology that reduces the complexity and costs of integrating business processes into applications and frameworks. It consists of:

- **Workflow Engine:** An optimized runtime Java component providing the capabilities needed in a mission-critical production environment. It offers caching, thread-pooling, persistence, clustering, load balancing, and notification. The Engine is a scalable component with the ability to be deployed on multiple servers as a cluster.
- **Workflow Studio:** A visual design environment for developing workflows by dragging and dropping predefined tasks. Due to its flexibility and intuitive interface, the Studio can be used by programmers and business analysts alike. The Studio is customizable to enable integration into existing applications via XML.
- **Workflow Manager:** Provides monitoring and management services to support mission-critical deployments, including isolating bottlenecks in workflows, gathering and analyzing statistics, and reporting.

### Easy and Flexible

diCarta was impressed that Dralasoft had specifically designed its workflow technology to be incorporated within other applications: "The Dralasoft products were easy to embed because of their rich set of APIs," comments Jamison. "We have completely embedded Workflow Engine into our J2EE-based solution, and we are also using Workflow Studio, which is very flexible. Dralasoft solutions have met all of our workflow requirements."

diCarta found it easy to customize Workflow Studio—either disabling or adding new functions—and repackage it. "In the diCarta Contracts Compliance Manager module, the Process Designer is based on Dralasoft Studio," adds Jamison. "Process Designer lets contracting professionals define rules and alerts based on events in their transaction systems. That's a significant business advantage for our customers because it allows them to effectively enforce compliance with contracts and policies."

### Bottom Line

ISVs and some end-user organizations need an enterprise-class workflow engine that can easily be incorporated within an application. diCarta used embedded comprehensive workflow technology from Dralasoft to quickly and cost-effectively deliver an enhanced product to its customers. **bij**

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# VENDOR GUIDE

business integration JOURNAL

## Business Process Management Supplement

## Alternative Technologies

Alternative Technologies, founded in 1976, provides international consulting and educational services, specializing in business process management, integration, and database management. The firm has 20 years of BPM systems (BPMS) experience, having designed and developed a pioneering federated-BPMS and manufacturing system in 1981. The firm has consulted for companies such as BEA, Hewlett-Packard, and IBM regarding their BPM strategies. In partnership with renowned subject area experts, Alternative Technologies develops and licenses unique intellectual property such as process templates for BPMS. For example, our extended relationship management and optimization (ERMO) process template lets you install and customize decades of partner management knowledge on your BPMS. For more information on our consulting services or BPM seminars, e-mail: info@AlternativeTech.com.

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## BEA Systems, Inc.

The most pressing challenge IT organizations face today is building a fully integrated business. To realize comprehensive integration, the solution must provide not only core integration capabilities, but also an approach that unifies development and integration. BEA WebLogic Integration 8.1 is the first product to deliver this approach–a standards-based platform for application integration, Business Process Management, workflow, Web services and business-to-business integration, which also leverages the enterprise-strength capabilities of the industry-leading application server.

WebLogic Integration provides customers with a unified framework for business integration, simplified production and management, as well as a new extensible architecture for the rapid assembly and integration of applications, business processes, and partner trading communities. BEA WebLogic Integration has helped Global 2000 customers make their businesses more efficient, responsive and adaptable, by delivering rapid, open integration in half the time and cost of proprietary approaches.

By leveraging the award-winning BEA WebLogic Workshop™ development environment, BEA WebLogic Server™, industrial-strength messaging broker and data transformation capabilities, pre-built and custom controls, and a catalog of standards-based application adapters, WebLogic Integration presents a seamless environment for integration specialists and application developers alike.

WebLogic Integration™ is an integral part of the WebLogic Enterprise Platform™, the industry's leading application platform suite from the world's leading application infrastructure software provider. The BEA WebLogic Platform enables IT to focus on business goals–instead of infrastructure integration–shortening project cycles and reducing complexity.

**BEA Systems, Inc.,** 2315 N. First St., San Jose, CA 95131. Voice: 800-817-4BEA or 408-570-8000; Website: www.bea.com

## Business Objects

Business Objects is the world's leading Business Intelligence (BI) software company. BI enables organizations to track, understand, and manage enterprise performance. The company's solutions leverage the information that is stored in an array of corporate databases, ERP, and CRM systems.

Popular uses of BI include enterprise reporting, management dashboards and scorecards, customer intelligence applications, financial reporting, and both customer and partner extranets. These solutions enable companies to gain visibility into their business, acquire and retain profitable customers, reduce costs, optimize the supply chain, increase productivity, and improve financial performance.

In December 2003, Business Objects completed the acquisition of Crystal Decisions, the leader in enterprise reporting with more than 16 million licenses of Crystal Reports shipped worldwide. The combined product line includes software for reporting, query and analysis, performance management, analytic applications, and data integration. In addition, Business Objects offers consulting and education services to help customers effectively deploy their business intelligence projects.

Healthcare organizations face a particularly daunting task when it comes to mastering the huge amounts of data they collect. Business Objects helps these organizations improve both overall performance and regulatory compliance by enabling them to track, understand, and manage information from every corner of the enterprise. Business Objects has more than 24,000 customers in more than 80 countries. Business Objects healthcare customers include Aetna, Allegiance Healthcare, Blue Cross Blue Shield, Detroit Medical Center, Eli Lilly & Co., Kaiser Permanente, Medtronic, Owens & Minor, Pacific Care Health Systems, and Pfizer, Inc.

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## Cemantica

Enterprise systems integration has one motivation–to enable accurate and timely business information exchange and processing. Despite anticipated lower costs, increased revenues, and business information control, mixed results and unexpected expenses often result. Business information incompatibilities can force manual exception processing and perpetual redesign of data transformation. Focusing on implementation and data reformatting is not enough. Information interoperability (the semantically, syntactically, and structurally accurate and timely exchange of business information) is required.

Business process management (BPM) requires understanding how systems use information. The information conveyed by structure, and the semantics of each piece of information in the context in which it is used and needed must be addressed, and not just data syntax. An information interoperability solution that will enhance productivity and competitiveness for your specific environment is essential. Only then can your valuable, proprietary, distinctive processes be streamlined.

Cemantica offers the first BPM-compatible information interoperability solution: Cemantica Interoperability Management (CIM). CIM services address the "logical level of information exchange," today's key challenge to achieving information interoperability. CIM focuses on the meaning and context of data, identifying and resolving the costly conflicts that affect communication between people, organizations, and applications that generate or process the information. Cemantica's three key modules–Data Profiling, Data Integrity and Data Integration–significantly reduce laborious and costly exception processing by covering every facet of information interoperability: semantic, syntactic, and structural.

Located in San Jose, CA, Cemantica is a privately held corporation with a proven management team. For more information, email info@cemantica.com or visit www.cemantica.com.

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## Dralasoft

As a leading innovator of Business Process Management (BPM) solutions, Dralasoft pioneered the embeddable workflow market with its product entry in early 2000. Its flagship product, Dralasoft Workflow, is a 100 percent Java component that includes a high-performance and scalable workflow engine with a suite of graphical tools, including Dralasoft Workflow Studio, a best-of-breed visual design tool. Dralasoft's customers include Xerox, Sears, Agile Software, and Sony.

Dralasoft Workflow is a comprehensive workflow and BPM solution. It provides everything you need to design, deploy, and manage business processes for embedded and IT infrastructures. Dralasoft products provide customers with the ability to quickly and smoothly integrate workflow technology based on standards such as XML, LDAP, SOAP, BPEL, and J2EE. Dralasoft Workflow Studio is a visual design tool for developing workflows by dragging and dropping predefined and custom tasks onto a workflow template. Dralasoft Workflow Manager provides monitoring and management services to support mission-critical deployments, offering you complete insight into the activity of your workflows individually or as a collective group. Dralasoft Workflow Engine is a highly optimized, run-time Java component, providing the capabilities needed in a mission-critical production environment and is the core component of the Dralasoft Workflow solution.

Based in Westminster, CO, Dralasoft is a privately held corporation.

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## FileNet Corp.

FileNet Corp. helps organizations make better decisions by managing the content and processes that drive their business.

FileNet's Enterprise Content Management (ECM) solutions allow customers to build and sustain competitive advantage by managing content throughout their organizations, automating and streamlining their business processes, and providing the full spectrum of connectivity needed to simplify their critical and everyday decision-making.

FileNet ECM solutions deliver a comprehensive set of capabilities that integrate with existing information systems to provide cost-effective solutions that solve real-world business problems.

Since the company's founding in 1982, more than 4,000 organizations, including 81 of the *Fortune 100*, have taken advantage of FileNet solutions for help in managing their mission-critical content and processes.

Headquartered in Costa Mesa, CA, the company markets its innovative ECM solutions in more than 90 countries through its own global sales, professional services and support organizations, as well as via its ValueNet® Partner network of resellers, system integrators, and application developers.

**FileNet Corp.,** 3565 Harbor Blvd., Costa Mesa, CA 92626-1420. Voice: 714-327-3400; Website: www.filenet.com

## Fuego

Fuego™ provides solutions to design, execute and continuously improve end-to-end business processes that span people, applications, and organizations. FuegoBPM helps companies orchestrate, manage and optimize business processes with top-down, affordable software that is implemented quickly–delivering rapid, measurable ROI.

Companies use our BPM solution to gain process excellence and get business results. Our clients include the largest BPM implementations in the world in terms of number of users, transactions and processes for regulatory compliance, claims processing, loan origination, customer activation, order fulfillment, purchase orders, HR, credit management, and more. With FuegoBPM, process owners quickly design, implement and change business processes.

These adaptive process applications empower our customers with speed, control and agility:

- Speed in designing, integrating, and deploying processes
- Control over the automated process by the process owner, including visibility into and management of the flow of work throughout the entire process
- Agility to modify the process quickly with no changes to the underlying systems.

FuegoBPM includes everything needed to design, implement, and continuously improve business processes:

- Visual process modeler
- Self-generating business integration facility
- Business and transition rules
- Simulation and debugging facilities
- Powerful standards-based orchestration engine
- Work portal
- Process analytics and BAM
- Organization administration
- Web services support
- And more.

Fuego delivers dramatic and measurable ROI. With Fuego, customers achieve the following advantages:

- Most complete solution available
- Unequaled power and reliability
- Simplicity
- 100 percent customer success.

**Fuego,** 2400 Dallas Pkwy., Suite 350, Plano, TX 75093. Voice: 972-801-4200; Website: www.fuego.com

## HandySoft Global Corp.

HandySoft Global Corp. delivers innovative solutions for Business Process Management (BPM), workflow automation, and collaboration to commercial and government marketplaces. Built on the foundation of BizFlow®, the award-winning BPM platform, our solutions automate and simplify processes, enforce best practices, improve quality and productivity, and foster internal and external collaboration.

BizFlow offers complete capabilities for building and managing automated business processes, including tools for designing and monitoring the processes, presenting and accessing work, integrating existing IT systems, and platform administration.

BizFlow 9.0 is planned for release in spring 2004. BizFlow 9.0 enhancements include Process Simulator, an integrated simulation and analysis environment that enables fast definition of business conditions affecting process and participant performance, with a high-performance engine delivering results in seconds. Unique custom report generation and optimization features for creating and sharing key findings help justify process improvement initiatives by highlighting inefficiencies and impact before implementation. BizFlow 9.0 includes wizard-based Web and J2EE service features for reusable, standards-based interoperability with IT resources such as rule engines, enterprise applications, and external partner systems. Supporting Business Activity Monitoring (BAM) and "reaction in real-time," wizard-based Event Response features have been expanded to include e-mail, queue, HTTP, database, and file events for process initiation and activity completion.

BizFlow solutions are available with prepackaged, customizable process templates and forms for common industries and applications, and also as custom-built solutions that meet specific organizational requirements. Installed in more than 380 sites with 2.5 million users worldwide, BizFlow has won awards from the Workflow Management Coalition (WfMC) and *Transform* magazine.

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## iGrafx

iGrafx is a leader in software and services for Business Process Analysis (BPA). The iGrafx family of products is a comprehensive suite of BPA tools that help organizations visualize, analyze and optimize their processes. Our underlying approach to BPA begins with a focus on the business analyst's ability to quickly and easily document and analyze process flows in a consistent and easy-to-understand notation. iGrafx provides a solid foundation for approaching business process documentation from the most logical starting point–the business analyst–and easily translating it into an IT-centric, execution view. iGrafx supports the leading process notation standard–Business Process Modeling Notation (BPMN) and execution language–Business Process Execution Language for Web Services (BPEL4WS).

iGrafx provides integrated support for major corporate process initiatives and regulatory requirements such as Six Sigma, Lean, ISO, Sarbanes Oxley, and TQM. iGrafx integrates with the leading Business Process Management (BPM) execution environments, corporate application development environments, and enterprise architecture environments. iGrafx easily supports both centralized and decentralized approaches to process improvement through flexible deployment options and a client/server architecture.

iGrafx BPA products and services provide an easy to use, powerful, and flexible suite of solutions for the range of process management challenges an organization faces. Easy enough for business users, powerful enough for process improvement experts, and flexible enough for IT users, iGrafx enables organizations to design, simulate, and implement high-performance business processes.

**iGrafx,** 7585 SW Mohawk, Tualatin, OR 97062. Voice: 503-404-6050; Website: www.igrafx.com/bij04

## Intalio

Founded in July 1999 by recognized innovators in enterprise software development, Intalio is a privately held, venture-backed company headquartered in San Mateo, CA, with offices in the U.K. and in central Europe.

Intalio's mission is to empower Global 2,000 firms to become process-managed organizations.

With its Intalio|n3 product line, now in Version 2.5, Intalio is a leading provider of enterprise-class Business Process Management Systems (BPMS) for orchestrating processes that span multiple systems or partners. It is the first and only standards-based and platform-neutral BPMS that enables best-in-class business processes to be extended into executable and manageable processes that can be directly deployed onto existing IT assets and seamlessly directed by business users.

**INDUSTRY CREDENTIALS**

Intalio serves the market with an impressive array of BPM credentials. The company:

- Initiated and co-founded BPMI.org in August 2000
- Authored key BPM standards, including the Business Process Modeling Language (BPML) and the Business Process Modeling Notation (BPMN)
- Co-submitted with IBM and Microsoft the Business Process Execution Language (BPEL) 1.1 specification to OASIS in April 2003
- Participates in the OASIS Technical Committee to guide BPEL to standardization.

This work has strengthened not only the BPM market, but also Intalio–providing invaluable experience and insight the company has distilled into its own enterprise-class BPMS. By using BPM offerings from Intalio, organizations now have the power to completely and seamlessly manage the entire life cycle of their business processes–from design to execution to optimization.

**Intalio,** 1900 S. Norfolk St., Suite 290, San Mateo, CA 94403-1164. Voice: 650-577-4700; Website: www.intalio.com

## iSpheres

iSpheres is one of the pioneers in Business Activity Monitoring (BAM). Even before the term existed, iSpheres was enabling companies to "sense and respond" to dynamic opportunities and threats. The company's core event-driven architecture and complex event processing capabilities are the basis of iSpheres' real-time event server, called iSpheres Halo.

With successful deployments in finance, supply chain and government, iSpheres recognized that each BAM application, regardless of the industry or business area, possesses a similar set of functional requirements, which include:

- Efficiently monitoring distributed sources of data and events
- Correlating and detecting critical events in real-time
- Alerting users and/or triggering application flows upon detecting an event
- Allowing end users to define and manage event scenarios on-the-fly

BAM applications require some degree of customization to support a customer's design requirements and business case. It is for this reason that iSpheres can serve many market segments with a central, extensible platform as opposed to "point solutions."

To minimize development time, iSpheres Halo utilizes industry-accepted programming models and standards, including Java, XML, SOAP, and JMX. iSpheres Halo also leverages a loosely coupled hub-and-spoke architecture, which enables multiple applications to be developed on one platform and provides a lower total cost of ownership.

The origins of iSpheres are a 10-year research project funded by the Defense Advanced Research Projects Agency (DARPA) and the Air Force Office of Scientific Research (AFOSR). The research was conducted at the California Institute of Technology (Caltech) to develop the underlying mathematics, algorithms and framework for dynamically reconfigurable command and control systems.

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## Lombardi Software

Lombardi Software is the developer of TeamWorks®, award-winning Business Process Management (BPM) software that enables organizations to identify and improve process inefficiencies that, when not addressed, cost millions of dollars in lost revenue, margin, and operating expenses.

Lombardi's unique approach to BPM focuses on managing processes and easily adapting to business changes–enabling companies to continuously derive value from their operational and financial processes over time. By providing ongoing visibility into business processes and increasing the velocity with which organizations can respond to mission-critical events, TeamWorks enables Global 2000 companies, such as Sprint, Pulte Mortgage, Dell, Hasbro, and Wells Fargo, to create new efficiencies, improve profitability, and increase their overall business value through Continuous Process Improvement (CPI).

TeamWorks is changing the way companies manage their business with out-of-the-box performance tracking, reporting and improvement capabilities that move BPM beyond process automation and into active process management. TeamWorks continuously monitors (BAM) for critical business events, throughout multiple internal and external systems, or within specific processes, collects data and transforms that information into a meaningful context that enables senior executives and managers to make informed, real-time decisions that drive process efficiencies and operational responsiveness. Lombardi's Zero-Code™ technology, designed to facilitate the rapid change required to deliver CPI, underlies the entire TeamWorks platform.

Key processes benefiting from Lombardi's BPM solutions include: customer order management, supplier management, purchase order management, inventory management, product distribution, customer service, financial/treasury management and regulatory management.

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## Microsoft

Building the Smart, Connected Enterprise With BizTalk Server 2004

Microsoft creates technology to enable business users to critically analyze how their company runs and to be more agile when engaging in new business opportunities. Microsoft BizTalk® Server 2004 is at the heart of its vision for delivering a comprehensive integration solution.

As part of Windows Server System™, BizTalk Server 2004 helps customers efficiently and effectively integrate systems, employees and trading partners through manageable business processes, enabling them to automate and orchestrate interactions in a highly flexible, highly automated manner. These capabilities are inherently integrated into the application architecture of Windows Server System and combine the benefits of tight integration with Microsoft Office and Microsoft Visual Studio®. .NET. Business Activity Monitoring (BAM) tools, such as Microsoft Office InfoPath™, Microsoft Office Visio®, and Microsoft Office SharePoint™ Portal Server, integrate with BizTalk Server to provide customers with real-time visibility into business processes. Furthermore, BizTalk Server ensures optimal productivity for developers by harnessing the familiar development environment of Visual Studio and standards-based XML Web services. As a result, developers can deliver more secure and reliable business process integration within and across organizational boundaries. Existing mainframe and AS/400 systems can also be connected to new systems and business processes by using Microsoft Host Integration Server with BizTalk Server. With its comprehensive infrastructure for integrating applications, data sources, and people within heterogeneous environments, BizTalk Server provides the foundation for building and managing the smart, connected enterprise.

**Microsoft Corp.,** One Microsoft Way, Redmond, WA 98052-6399. Website: www.microsoft.com/biztalk/

## Pegasystems

Pegasystems provides rules-based, smart Business Process Management (BPM) software for large organizations, delivering significant ROI and providing them with the flexibility and agility to respond to changing business needs. With annualized revenues of approximately $100 million and a blue-chip customer base, the company offers both horizontal, enterprisewide BPM platforms and solutions, and packaged vertical BPM applications for the financial services, healthcare, insurance, and government markets.

PegaRULES Process Commander V4 is the latest generation of Pega's smart BPM platform for efficiently developing, executing, managing and evolving decision-intensive BPM applications. Java and XML-based, it features built-in versioning, simple rules creation forms oriented to business users, and a built-in, browser-based development environment.

To deliver operational, quality and service excellence across the enterprise, Pegasystems offers such horizontal solutions as Pega Quality & Exception Manager and Pega Customer Process Manager. The former enables large organizations to maximize operational performance, quality initiatives and customer satisfaction through proactive exception management; the latter provides a process-oriented contact center solution that applies an organization's business rules and best practices to provide exceptional customer service and one-call resolution across all customer touchpoints.

Pegasystems also leverages its expertise in financial services and healthcare with a range of industry-specific, packaged applications and product suites, delivering solutions for card issuers and acquirers; check research and adjustment; payments investigations; healthcare claims processing; and healthcare service and support, including both member and provider services.

Pegasystems (NASDAQ: PEGA) is headquartered in Cambridge, MA, and has regional offices in North America, Europe, and the Pacific Rim.

**Pegasystems Inc.,** 101 Main St., Cambridge, MA 02142. Voice: 617-374-9600; Website: www.pega.com

## Proforma Corp.

Today's top business leaders know that an automated process will not save their organization time or money unless a well-designed, strategic plan is in place first. That's why they ensure their processes support the organization's strategic direction before they launch costly BPM initiatives. Smart executives realize that process modeling and analysis are paramount to effective BPM planning.

Proforma Corp. is an established leader in business process improvement, process simulation, and enterprise architecture. Its powerful ProVision modeling suite and experienced service team combine to help organizations optimize their business and IT.

Over the last decade, thousands of premier organizations have discovered why industry analysts praise ProVision for its ease of use, functionality, and strong methodology. An integrated solution with a Web-server repository, ProVision quickly delivers results by defining strategy, improving processes, and modeling requirements and systems. All these steps lay the groundwork for successful BPM.

ProVision is the ideal choice to front-end BPM tools because it:

- Promotes process analysis and improvement prior to automation
- Models both automated and manual activities, which are important to enterprise operations but often forgotten in BPM efforts
- Serves as a single front-end to many process automation tools.

ProVision's robust process modeling and simulation environment allows organizations to analyze current operations and design and simulate new and improved processes. In other words, ProVision empowers organizations to become process-centric. As a result, they save time and money and add value.

Ensure your BPM initiative's success and secure your competitive advantage. Call Proforma.

**Proforma Corp.,** 26261 Evergreen Rd., Suite #200, Southfield, MI 48076. Voice: 888-PVW-6903; Website: www.proformacorp.com

## SeeBeyond Technology Corp.

The ability to quickly recognize and respond to changing market, partner, and customer dynamics is critical in today's environment. Process-driven business integration is a must, allowing organizations to adjust quickly and dynamically to these changing business conditions with minimal impact. As a leading provider of enterprise integration solutions, SeeBeyond allows companies to automate and optimize business processes that orchestrate the flow of activities across any number of systems, bridging the gaps and inefficiencies left open by siloed processes.

Based on 14 years of software innovation and real-world experience in integrating systems across Global 2000 organizations, SeeBeyond delivers the industry's first fully J2EE-certified, integrated composite application network built on a comprehensive integration platform. With the SeeBeyond Integrated Composite Application Network (ICAN) Suite, organizations are now capable of rapidly deploying an infinitely scalable infrastructure to enable the development, deployment, execution and management of composite applications based upon a completely open, standards-based, service-oriented architecture. Composite applications leverage existing systems and logic, and repurpose them to achieve new business goals. *Beyond eAI*, the SeeBeyond ICAN suite, helps organizations extract real business value from their investments to dramatically improve business operations, resulting in reduced costs, increased market share, and improved customer service and satisfaction.

SeeBeyond has more than 1,880 customers worldwide, including ABB, ABN Amro, BHP Billiton, The Cleveland Clinic, The Dial Corp., DuPont, Florida Power & Light, Fluor Daniel, Fujitsu, General Motors, Halliburton, Hertz Corporation, Hewlett-Packard, Pfizer, Samsung, Sprint, Sutter Health, and UnitedHealth Group.

**SeeBeyond Technology Corp.,** 800 E. Royal Oaks Dr., Monrovia, CA 91016. Voice: 800-425-0541; e-Mail: info1@seebeyond.com; Website: www.seebeyond.com

## Staffware

Staffware is a leading Business Process Management (BPM) specialist with more than 1,500 enterprise customers within the banking, insurance, telecommunications, utilities, general commercial, manufacturing, and government sectors. Staffware is headquartered in the U.K., has offices in 17 countries, and employs approximately 370 people. The company is listed on the London Stock Exchange and is the leading profitable, debt-free, global vendor focused exclusively on providing BPM solutions. Staffware Corp. is headquartered in New York City with sales, development and support centers in Arlington, TX, and Spokane, WA.

Staffware, with its nearly 20 years of BPM expertise, has unique insight into the complex people-to-people, people-to-application, and application-to-application interactions that make up business processes. Its Staffware Process Suite builds on this insight to provide a complete set of tools to create, transform and streamline the internal and external processes and tasks of an organization. This platform enables the creation of an Independent Process Layer™ that separates process from the underlying IT/data environment, facilitating the rapid development and change to an organization's process. The Staffware Process Suite is an open, standards-based solution that ensures seamless integration and full interoperability with existing IT infrastructures and applications.

**Staffware,** 1270 Avenue of the Americas, 27th Floor, New York, NY 10020. Voice: 212-218-7420; Website: www.staffware.com

## Ultimus

Ultimus provides a complete software product, the Ultimus BPM Suite, and complementary services to help organizations build competitive advantage faster and easier than is possible with any other alternative. The Ultimus solution is simply the fastest and easiest BPM solution on the market to implement, manage, and use. It provides hundreds of out-of-the-box features that can be leveraged in automated business processes, without requiring programming or scripting. Additionally, a variety of open interfaces are available to extend and integrate the product into any existing corporate infrastructure, and the Ultimus Workflow Development Methodology provides a clear path for successful implementations, with guidelines for activities, deliverables, and timeframes for your project team.

Featuring easily understandable user interfaces, the BPM Suite promotes daily use in process implementation and management for non-technical software users. Customers in a variety of industries use the suite to support customer care (e.g., custom quote processing, new account setup), product development (e.g., localization, defect resolution), administration (e.g., invoice processing, capital equipment requests), human resources (e.g., employee roll-on, merit reviews), and many more areas. In most cases, they are using the product to support many different processes that cross departmental boundaries to deliver superior service. For example, a growing, top-10 financial institution has implemented more than 100 automated processes in the last two years. Many other customers have deployed 30 or more processes that touch users and customers throughout their organizations. Customers who have partnered with Ultimus have captured a number of diverse and compelling benefits, including higher productivity, improved quality, reduced cost per transaction, and increased profits.

**Ultimus,** 15200 Weston Pkwy., Suite 106, Cary, NC 27513. Voice: 919-678-0900; Website: www.ultimus.com

## Vitria Technology

Business processes are a fundamental building block of organizational success. Vitria (NASDAQ: VITR) is the only company that brings together a unique, proven combination of software, services and vertical market expertise to help customers develop a clear and deep understanding of business processes, how they function, and how to manage them to impact the business's bottom line.

From its heritage as an EAI pioneer and early leadership in Business Process Management (BPM), Vitria was first-to-market with a commercially viable BPM solution, adding those capabilities to the Vitria:BusinessWare™ platform in 1997. As a result, Vitria enjoys a market lead of more than seven years of R&D, four years of real-world deployments, and more than 500 satisfied customers. Vitria has also built well-known expertise in healthcare, telecommunications, financial services and manufacturing, providing a rapid ROI for customers.

Vitria's differentiator, Business Process Integration (BPI), uses visual models to provide real-time visibility and control of strategic business processes that cross applications, data, people, and companies. Through a fusion of best practices, process integration technology and implementation services, Vitria provides the missing links needed to align IT investments with business goals, such as operational efficiency, lowering costs and reduced time-to-market for new products and services. In other words, making your BPM solution fit your business, not the other way around.

Leading global companies trust Vitria to help them create measurable, sustainable business outcomes using BPI. They include: AT&T, BankFirst, BP, Blue Cross Blue Shield Association and member companies, DaimlerChrysler Bank, Ford, Humana, MasterBrand Cabinets, Nissan, PacifiCare, Royal Bank of Canada, Sprint, Toro, XM Satellite Radio, and hundreds of others.

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## webMethods

webMethods is the industry's first Web services infrastructure company, delivering enterprise-class solutions for integration, Web services, Business Process Management (BPM), and Business Activity Monitoring (BAM). Combining an innovative product portfolio with solid experience and unparalleled support, webMethods helps customers streamline their business operations, maximize their existing IT assets, and reduce their costs.

Through world-class Web services infrastructure, integration, portal and analytics technologies, webMethods delivers the ability to build a new generation of business systems, providing unparalleled visibility and control.

At the core of webMethods is webMethods Fabric™, a standards-based, Enterprise Service-Oriented Architecture (ESOA) infrastructure for building, deploying and managing Web services applications. webMethods Fabric takes Service-Oriented Architecture (SOA) concepts to the next level by combining powerful, comprehensive SOA capabilities with enterprise-class quality of service (QoS). As the first delivered ESOA solution, webMethods Fabric enables enterprises to quickly go from small, static, brittle, ad hoc networks of unmanaged Web services to larger, dynamic, robust, coordinated networks of managed services.

Recognized in 2003 as the fastest growing software company in North America by Deloitte, webMethods is headquartered in Fairfax, VA, with offices throughout the U.S., Europe, Asia Pacific, and Japan. webMethods has more than 1,050 enterprise customers that include Global 2000 leaders such as Bank of America, Citibank, Dell, Eastman Chemical, Grainger, and Motorola. webMethods has targeted solutions for the consumer packaged goods/retail, financial services, government and manufacturing industries. webMethods' strategic partners include Accenture, AMS, BearingPoint, BMC Software, Cap Gemini Ernst & Young, CSC, Deloitte, EDS, HP, i2 Technologies, PeopleSoft, SAP AG, Siebel Systems, and TCS.

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