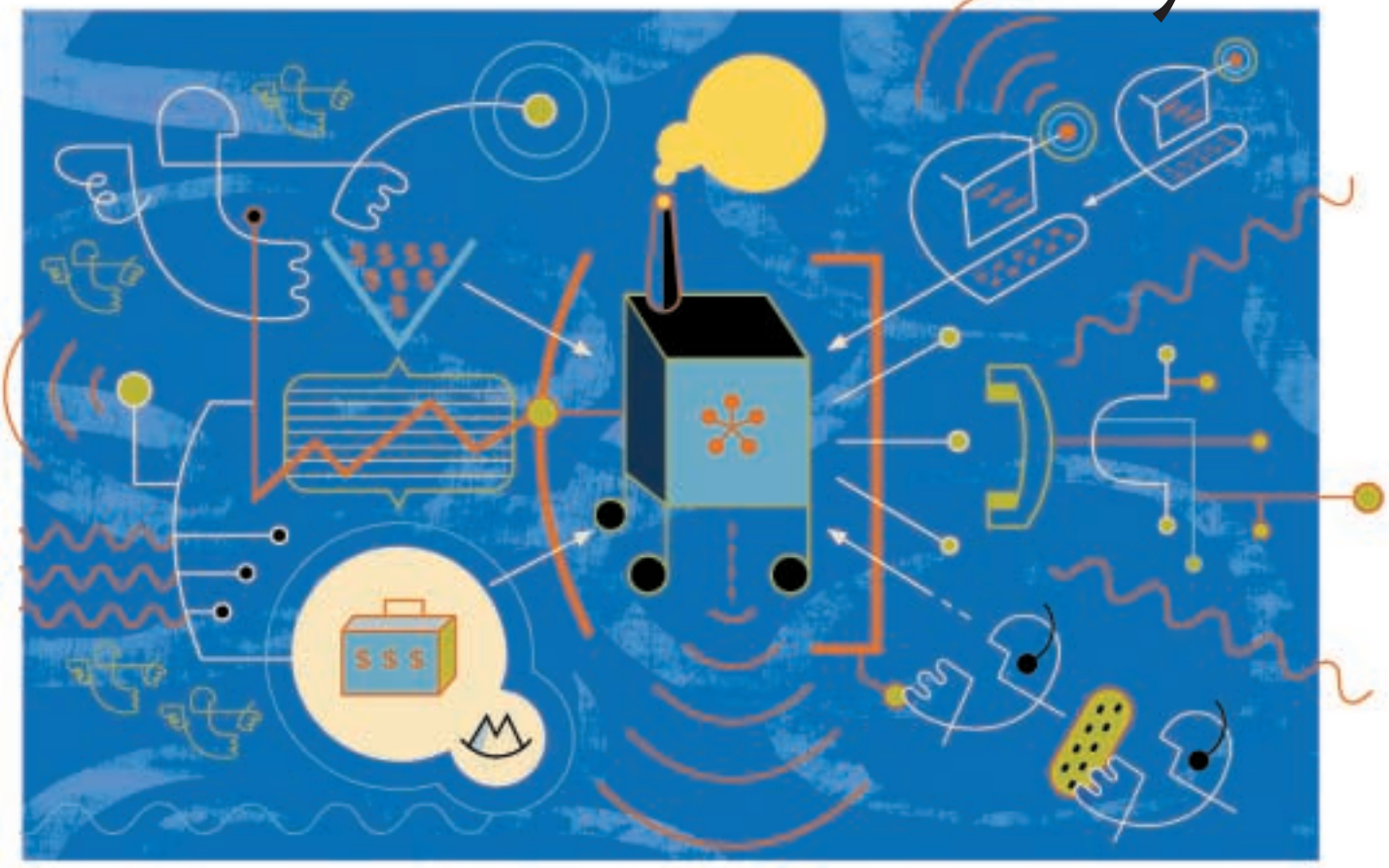
BUSINESS PROCESS MANAGEMENT SYSTEMS

Environmental Policy



A NEW SOFTWARE CATEGORY POWERS A NEW WAY OF COMPETING

BY HOWARD SMITH AND PETER FINGAR

BUSINESS PROCESS INNOVATION AND IMPROVEMENT ARE NOW recognized as the paths to huge gains in productivity—something companies are desperately seeking in the current down-turned economy. Unfortunately, our current software architectures and application development methods pose technical hurdles that block the execution of the Business Process Management (BPM) vision—they simply were not designed to take companies beyond where they are today. Undaunted by current limitations, resourceful business and technology thinkers and doers have been busy charting a new path to productivity and pushing the technology envelope by placing business processes, their representation, and surrounding software architecture on center stage in the world of information technology.

What led to this new thinking and approach to business automation? The great benefit of last decade's ERP packages was supposed to be their integration—everything the business needs, all in one place. But with the advent of the business Internet and today's competi-

ILLUSTRATION FOR IW BY CELIA JOHNSON

tive pressures, companies need to extend business processes electronically to customers, trading partners, and suppliers (indeed, to other disparate internal application packages such as CRM and SCM). It did not take long to become evident that ERP and other monolithic systems were not up to the task. Fortunately, rather than discarding existing packaged applications and starting over from scratch, it turns out that these systems are valuable for both internal and external process-based systems. If their functionality can be tapped and encapsulated as software components that can contribute to new or radically improved business processes, then companies can pick and choose which components to use. Companies can even mix and match them with components from third parties to create new, "best-of-breed" applications to compete in the current economy and beyond.

As packaged applications are tapped to contribute to new business processes, the resulting components become more finely grained and independent. This approach of decomposing and transforming monolithic application functionality to serve new business processes creates the need for a new category of software, the Business Process Management System (BPMS). The BPMS is a single, unified modeling, integration, and execution environment that can be applied to the implementation of literally any business process. It brings together legacy integration with next-generation business process collaboration, joining these two worlds with business process automation, as shown in Figure 1. The BPMS can be thought of as an "engine for processes."

The BPMS provides the mechanisms to stitch application components together to automate and share strategic and operational business processes, in a manageable and flexible way. By comparison, in the way that the Relational Database Management System (RDBMS) enables the sharing of business data among applications and companies (using a common language known as SQL), the BPMS enables the sharing of business processes (using a common language known as BPQL). The BPMS separates out functional components from traditional packaged applications in much the same way that the database management system separates out data from applications into a shared repository to better manage their use. Driven by the current economic downturn and the obvious need for new sources of productivity, Business Process Management (BPM) is rapidly becoming the business platform of choice for Global 2000 organizations, and the BPMS is its technology engine.

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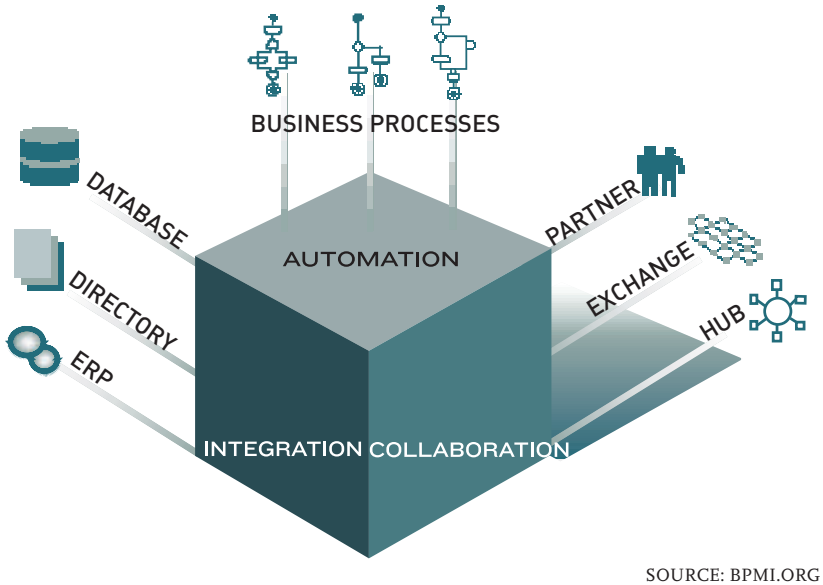
The integration of best-of-breed components into business processes begins with an explicit, top-down specification of what they are supposed to do together (a process model) rather than a hidden, inflexible, technical specification of a system interface. But that's not all. Other key and compelling advantages derived from deploying a BPMS to manage business processes include:

- Application environments can be bridged, allowing them to share descriptions of end-to-end business processes—replacing the need for further integration at the application or data level with integration at the business-process level
- Human activity and workflow can be incorporated across the composite, process-centric application

Figure 1.

The Business Process Management System



SOURCE: BPMI.ORG

Table 1.

From monolithic to component-based to process-based systems

SYSTEM EVOLUTION	CHARACTERISTICS
Base level: Monolithic legacy systems; Better than nothing, but modern process systems are right now considerably in advance of this base level	■ Separate process manager ■ Monolithic legacy system ■ Granularity at level of applications ■ Inflexible and coarse-grained activities only
Step 1 Components easy to call; Many products calling themselves process management are at this level of maturity	■ Business components ■ Interfaces for component activation ■ Granularity aligned with process activities ■ Process-driven approach ■ Components ingrain some process states
Step 2 Fully modeless components; The best process managers are at this level of maturity	■ Any-sequence, any-time operations ■ Additional component complexity ■ Changes in process greatly simplified ■ Easy to re-arrange activities in any sequence
Step 3 Process engine integrated at component level; This is the domain of vendors who are creating new approaches to the management of business processes	■ Components work seamlessly with the process manager ■ Process model is inherent to all components and component design ■ All components modeless ■ Most processes managed by process virtual machine ■ Process manager integral to business system ■ Operation invocation native to process modeling language ■ Application processes can be projected into the process-management domain ■ Persisted process data end-to-end available to application layer

■ Software components can be orchestrated in new ways

■ A business process description can be customized for specific customers or partners

■ An integrated user interface can be provided through a single portal that, in turn, provides legacy integration

■ The overall operation and optimization of a business process can be monitored, optimized, and analyzed

■ New applications can be written that interact with and transform the whole process, from end to end, without requiring software engineering.

The evolution of business systems from monolithic application packages to component-based and finally to process-based systems has been underway for a number of years. The BPMS culminates the ascension of business processes as the locus of activity in developing agile information systems, as shown in Table 1.

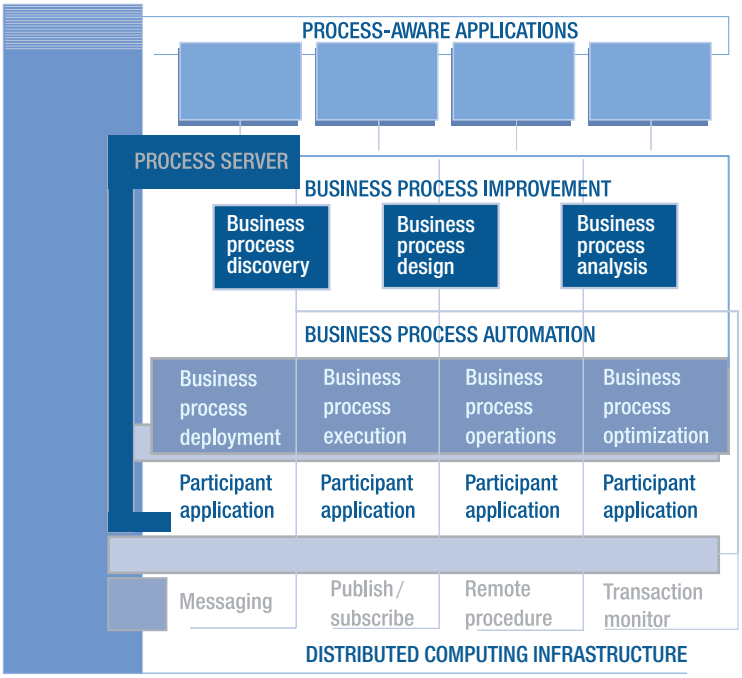
In the new process-centric world of IT, software architecture aligns more readily with business activity—even across business boundaries. Processes can be expressed in any level of detail right down to fine-grained computational components, making it much easier for businesses to modify, redesign, and evolve business processes. Best of all, top-down process design activity can be driven directly by organizational objectives such as time, cost, and best practices.

Business Process Integration, Automation, and Management

Business process integration (BPI) focuses upon the set of activities that must be completed in order to satisfy a business request. Whereas enterprise application integration (EAI) solutions have typically supported discrete application events, BPI handles extended activity sequences, long-lived processes, compensating transactions, failures and cancellations driven by business requirements, or conditions outside the con-

Figure 2.

Process-Aware Applications and Process Servers.
Process-aware applications are built on Process Servers—they can span systems, processes, enterprises, and channels—and transact with, analyze, and transform business processes.



trol of IT. Integrated processes include simple mechanisms to back out of failure conditions even when such rollbacks are not supported by back-end ERP systems.

Business process automation (BPA) builds on BPI by providing tools to model, simulate, deploy, and operate new end-to-end processes. Process automation bridges the gap between automated and manual processes by including human activities supported by workflow collaboration. Process automation is an adaptive structure, designed to provide increased agility, decision support, and real-time adaptation. Whereas integrated processes are tied to the legacy application elements they integrate, automated processes run in a separate environment in which complex logic and rules can be executed.

The Business Process Management System builds on BPA by completely separating process descriptions into a repository, which makes sense of the legacy environment and provides a mathematically normalized environment within which processes can be designed, deployed, and managed. At run time, process data that represents state and messages between participants is persisted and can be exposed to "process-aware" applications through a process query language. By deploying a BPMS platform, the enterprise can manage its process assets in a manner similar to the way it manages its data assets with a database management system. In addition, existing tools for data manipulation and analysis can be leveraged. The next generation of ERP, CRM, and SCM applications will be built in this process-centered paradigm and will tackle some of the most challenging problems in enterprise design. Such systems will oversee, evolve, and adapt whole processes over time, even responding to sensors in the surrounding business environment—laying the foundation for the event-driven, real-time enterprise. (See Figure 2.)

Getting There: The Onslaught of Hype

Already a variety of software vendors have staked a claim in the process management space: It seems everyone is suddenly process-centric. Over the last 18 months, as the benefits of business-process management have become clear, vendors in many different categories have begun to stress the process-management capabilities of their solutions. Process-management technology is part of a continuum, yet technical approaches vary enormously. Companies can expect to see process-management products of all shapes and sizes, ranging from workgroup products to departmental solutions to enterprise-scale platforms.

Such products are constrained by the heritage of their vendor's technology. For example, a workflow product evolving toward process management will provide a different set of capabilities than an application server evolving into a process server. For this reason, comparisons among current process-oriented products are difficult, even meaningless. Companies must exercise extreme due diligence in the search for comprehensive solutions, separating out the pretenders from the real competitors. Companies should look for the following trends as diverse software vendors try to climb the food chain to process management (see also www.fairdene.com/processes/vendors.html):

- Enhanced Enterprise Application Integration (EAI): EAI products that include process design, optimization, and analysis tools to assist in the deployment of the EAI solution
- BPM Middleware: process or workflow engines added to or integrated with EAI, application servers, and other middleware solutions
- Enhanced workflow: modern workflow products that extend the collaboration paradigm into the domain of enter-

prise integration by integrating middleware and transaction processing capability

- New process managers: sophisticated and adaptive software products that connect to and direct the operations of existing elements of the IT infrastructure, often positioning them in an enterprise supervisory role.
- Process development tools: application-development environments that use rules or processes to create applications, rapidly
- Process engineering tools: discovery, design, optimization, analysis, and simulation tools
- Business Process Management Systems: intended to play a role similar to that of a database management system, a comprehensive platform for the design, deployment, and direct execution of enterprise business processes.

Because of their lineage, few process management products provide a complete solution and those that claim to do so often rely on alliances or acquisitions of technologies that do not necessarily work together systemically or naturally. As with other IT solutions, such products and product suites vary in functionality, scale, reliability, and adherence to standards. In lieu of a complete solution, companies will rely on systems integrators and IT architects with the specialized knowledge and experience needed to combine best-of-breed components and process engineering methods to assist them in migrating to a process-centric architecture.

Many Global 2000 companies are deploying BPM point solutions or individual layers in the BPM stack. Many are finding it necessary to deploy EAI, some use workflow extensively, a few are piloting departmental process managers, most use existing business process reengineering (BPR) tools, and many have employed rule-based development to speed application delivery. It's a complex picture. Today's application stack is complex and the BPM layer is only part of the end-to-end process solution. A well thought-out, process-centric architecture, developed with an experienced systems architect—a guide who has gone before—will allow companies to plug in various point solutions today, and migrate more smoothly to comprehensive solutions tomorrow.

MANY GLOBAL 2000 COMPANIES ARE DEPLOYING BUSINESS PROCESS MANAGEMENT POINT SOLUTIONS OR INDIVIDUAL LAYERS IN THE BPM STACK.

From Organizational Change to Technological Implementation

Putting all the pieces together against the backdrop of existing and disparate IT systems is taxing, even for the best systems architects. The BPMS offers a radical simplification. Soon, the business vision of business-process management will become a technological capability powered by comprehensive business process-management systems. Furthermore, the primary driver for business process-management systems is economic, not technological, ensuring mainstream adoption. Shareholders expect companies to reach new heights in productivity, especially in the current down-turned, more fiercely competitive marketplace. Companies are under pressure to perform better and faster, to do more with less, and to be super-pleasing to customers. This means changing the way companies manage their business processes so they can innovate, collaborate with trading partners, and bring compelling new value to customers.

The key to greater productivity isn't just speeding up what a company already does; it's automating completely new activities or radically streamlining existing processes that can yield new gains. To strive for such lofty goals requires a change in kind in business automation. That change in kind centers on business-process management so that companies will have the agility they need to face an uncertain future. Business processes of higher value and strategic importance tend to be the most complex and dynamic processes. Such processes are difficult to coordinate across multiple partners and must rely upon continual process improvement to sustain competitive advantage.

Shaped by today's intense competitive pressure, the company of the future will need to be the master of business-process management. It will harness business-process management systems to translate business vision into technological reality. Rather than a layer in an already complex application stack, process management will be a capability delivered by the BPMS and available to all applications, business units, and partners. Now is the time to embrace process-centric technology and unlock the potential for real productivity gains of the magnitude needed to compete in the future. IW

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DIGITAL TAPESTRY

HoPE Springs Eternal

THE GREAT CONVERGENCE LEADS TO A DISAPPEARANCE OF THE NET

BY PETER FINGAR

WHERE THERE'S HYPE, THERE JUST COULD BE SOME HOPE. By connecting the dots between recently hyped developments in information technology, an amazing picture emerges. ■ Made from the convergence of technologies—some 40 years old while others are just hatching—we don't currently have a name for this new thing. While the Internet is pervasive, it's a passive, even stoic, pipe. By itself, it's not very helpful when it comes to solving the real problems of human-human and business-business information requirements. The new thing is not just a pervasive pipe, it's a holistic set of technologies fused together as one, and it has semantics built in to help both people and businesses meet their information requirements.

No one can predict how the Great Convergence is going to end, only how it's going to begin—and it has begun. Like the blind men describing the elephant, we can describe the parts, but only by connecting these part descriptions can we see an image of what's being sculpted by the Great Convergence. Here are some random notes to convey the gist of how key technologies are bubbling away in the primordial soup of convergence. Java was a first step, allowing "behavior" to flow through the pipe to any machine. XML allows for universal, self-describing data to flow through the pipe. Nascent Web services technology will allow software to become a universal service powered by UDDI, WSDL, and SOAP. Already Web services are touted as the Holy Grail of integration and will lead to the demise of EAI as a grueling activity. Model Driven Architecture (MDA) will shut down the old sweat shops of software engineering. The Grid, demonstrated by the SETI project, breaks down the meaning of the computer as a machine, harvesting available CPU cycles of a zillion machines.

Globus.org is where Web services meet the Grid to produce a universal commercial computer made of umpteen real CPUs whose power will be sold as a utility, like the electric company sells electricity. Network Attached Storage (NAS) technology separates out disk storage from any given computer. The Internet operating system makes local operating systems obsolete along with the Open Source movement, where Linux (now even on mainframes) deals a blow to proprietary platforms. The Business Process Management System (BPMS), where nimble business processes replace monolithic applications (ERP, CRM, SCM) and their hard-coded process logic, supersedes the very concept of "an application" with "process tone." Finally, the Semantic Web provides universal ontologies to bring some degree of intelligence to make sense of—and radically simplify using—all this stuff that's converging into wholeness.

THE NET WILL CHANGE; MAKING THINGS COMPLEX TO USE IS SIMPLE, BUT MAKING THINGS SIMPLE TO USE IS COMPLEX.

After the Great Convergence, the Internet no longer will be thought of as a "network" but as a "back plane" of a holistic information system in the sky where all these technology components plug in, converge—and disappear! One of today's most complicated yet easy-to-use global technologies is the telephone—a worldwide system of copper cables, fibers, satellites, microwaves, switches, software, billing systems, and operational support systems pushing electromagnetic energy around the world for the exchange of information. But we don't see any of these things; they are all transparent to the user. To grandma, or any other user, they disappear—just give her dial tone and she blissfully gets it all. She just uses the phone!

Hopefully more than a pipe dream, the Great Convergence will transform the Internet from a pipe to HoPE, the Holistic Pervasive Ecosystem. Because making things complex to use is simple, but making things simple to use is complex. HoPE, like the telephone, will be radically complex on the inside, making it easy to use from the outside. It will be radically cost-effective, and helpful both to people and the automation of businesses! Just give us HoPE, and we and our automatons will know what to do even though all the underlying technology components, including the Internet itself, disappear from our mind's eye. We will blissfully get it all and couldn't care less about its parts. IW

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