

# Next-Generation Process Automation

By Philip Larson, Director, Product Management, Appian Corporation

Business process management (BPM) software is being used today—in a wide variety of industries—to automate internal business processes, increase productivity, and help organizations avoid unnecessary spending. However, business users are quickly realizing that first-generation, or pure-play, BPM software is often unable to transcend basic process functionality or scale beyond small, departmental solutions. Constrained by inadequate architecture and insufficient functionalities, pure-play BPM simply falls short of reaching the level of responsiveness, agility and adaptability necessary to handle the challenges and uncertainties of a dynamic business environment.

Fortunately, the BPM software emerging today, increasingly referred to as “enterprise business process management suites,” combines a powerful core process engine with a highly scalable architecture. These enterprise BPM suites also feature a host of collaborative, knowledge-centric tools and a robust security layer, which adds a whole new dimension to process interaction. As a result of these new attributes, enterprise BPM suites greatly extend the basic functionality of pure-play BPM software, finally making process automation a practical reality.

## The Pure-play Problem

In most cases, the pure-play BPM stacks featured the following core components:

- ◆ **Process modeler**—tool for graphically mapping out the processes’ task flow;
- ◆ **Process engine**—the “brains” of the product that manages the state of processes and controls the hand-off of tasks to process participants;
- ◆ **Task manager**—manages the task lists by which human-oriented work is displayed to end users;
- ◆ **Forms designer**—a tool for designing the forms an end user will fill out to perform their work; and
- ◆ **Process analytics**—basic process reports (e.g. task lag time, task completion time, bottleneck identification).

While all of these components play an integral role in process automation, their potential for increasing organizational efficiency is extremely limited. For example, the interfaces of the pure-play stacks were not designed to support the day-to-day, task-oriented activities of mainstream business users. There were no collaborative tools (such as document management) to speed enterprise processes, or knowledge-centric tools to capture and manage enterprise data.

Moreover, to perform even simple solutions, the software would often need to be heavily customized and integrated with costly third-party tools.

Enterprise BPM suites emerged largely to address the limitations of first-generation BPM software. Among the most prominent additions to the pure-play stack are the new “suite” and “enterprise” features, which greatly enhance the power, versatility and scope of BPM.

The “suite” features were added to the pure-play stack so that the processes could make use of collaborative tools and analytics capabilities, like OLAP integration and business activity monitoring (BAM). Unlike its predecessor, enterprise BPM suites can generate “dashboard”-style performance and productivity reports, which enable decision makers to monitor their processes at varying levels of granularity (e.g. person, function or department) in real-time. They can then use the software to quantify, pinpoint and address the organizational weaknesses. For example, to unplug a bottleneck in an ongoing process, a decision maker may choose to reassign a task, escalate the task’s priority level or send updated instructions to managers.

Importantly, organizations using enterprise BPM suites are also less susceptible to security breaches and process misuse than those using older generations of BPM software. Recognizing the importance of safeguarding enterprise information, enterprise BPM suite developers created security and identity management layers for their software to manage the access controls and role-based permissions of the processes. In essence, these new layers allow process designers to decide who can perform certain actions and under what conditions they can perform them. For example, the process designers can use the suite’s secure Web-based administrator console to create roles for individual process components, modify the permissions for those roles, assign those roles to specific users and groups and even specify which users have access to the process model.

## Service-oriented Architecture (SOA)

The service-oriented architecture (SOA) used in enterprise BPM suites reflects an ever-increasing appreciation for the technology’s potential. SOA exposes an organization’s computing assets as Web services so that they can be combined to form new composite applications. This significantly reduces the amount of time and resources needed for new application development. Many, in fact, believe that what object-oriented design did for enabling reuse of code within an application, SOA does for enabling reuse of business logic between applications.

The service-oriented architecture of enterprise BPM suites plays an integral role in process design. The process designer can



Enterprise BPM Suites combine the power of process automation with the architecture and tools required to seamlessly deploy their capabilities across the entire enterprise.

access external services, include them within a new process and specify certain rules and conditions for when and how those services can be used. Individual process nodes, for example, can be configured to access third-party Web services at specific intervals. And SOA functions as a two-way street. Process designers can, for instance, “publish” their own process components into their service directory (UDDI). Other process designers can then find and call these components via Web services.

However, it is rare for all of the nodes in a process diagram to be based entirely on Web services. Consequently, enterprise BPM suites are also able to seamlessly mix SOA-based services with human tasks and calls to other service technologies, such as messaging systems.

### Event-driven Architectures

The combination of an event-driven architecture and a set of tools for reporting on those events in near real-time greatly increases the power and flexibility of BPM. In the business arena, decision makers depend on triggered notification “events” to alert them to situations or problems that could impact their businesses. Executives, for example, may need to be alerted when certain thresholds are exceeded or boundary conditions passed. Almost all employees, in fact, depend on events to notify them about adjustments in their workload or priorities.

Unlike pure-play stacks, enterprise BPM suites ship with event handling and event-generating tools built directly into the system. Process designers can therefore easily manage the events within a process. The most commonly used events are “notification” and “timer” events. Both of these event types can either be used independently within the process model or be attached to other nodes.

As the name suggests, “notification events” are used to alert employees to new tasks or to notify someone when a task has been completed. Enterprise BPM suites provide a secure, Web-based mechanism for displaying these notifications. In most cases, there is a “task manager” which displays individual or team-based tasks for users to perform through an e-mail-style interface. The users can then sort, filter and page through tasks to quickly and efficiently manage their work. Users can also use this console to view how the task fits into a larger process, what tasks have already been completed and what the rate of completion of similar tasks has been for past processes.

The “timer events” can be configured to delay or activate the execution of a task or process for a certain amount of time or on a scheduled basis (e.g. every Wednesday at 5 PM). Timer events can also be triggered when a process is finished or canceled. If the

process designer wishes, an event can even roll the process back to its original state.

In addition to creating events, process designers can include events generated by third-party applications into their processes. A medical supply company, for instance, may have a process in which a database trigger in an RDBMS is programmed to activate when the stock of bandages falls below a certain threshold. This “out-of-stock” event could then trigger the enterprise BPM suite to execute the “order new bandages” process.

***“What object-oriented design did for enabling reuse of code within an application, SOA does for enabling reuse of business logic between applications.”***

Third-party events can even change the course of processes that are already running. The so-called “decision gateway” nodes, which route processes according to certain rules and conditions, can be configured to wait for a particular message from a third-party application, such as ERP or CRM systems. Once the message has been received, the contents of the message can be used to guide processes in a particular direction.

### Enterprise Scalability and Intuitive Design

As previously noted, pure-play stacks are often limited in their scalability. The majority of solutions constructed today with pure-play stacks are small solutions, often confined in scope to a small number of process models. These tools are driven by relational back-end data stores, which are adequate for small loads, but quickly bottleneck as the number of process instances grows.

By contrast, enterprise BPM suite process engines use high-performance in-memory technology, sophisticated clustering, failover and caching techniques to process high-volume transactional operations and long-running processes. In addition, these process engines support load-balancing so that multiple engines can be used as the number of process

models and process instances increase. In this way, enterprise BPM suites can support implementations with more than 1,000 process models and 100,000 process instances, effectively ending any concerns over the scalability of BPM software.

Scalability aside, the most dramatic difference between the pure-play stacks and the enterprise BPM suites may be that the suites are intended for an entirely different sort of BPM process designer. The intuitive design of the enterprise BPM suite suggests that process design is no longer reserved for the technology-savvy. Enterprise BPM suites were created to allow business users to model, simulate and manage their organization’s processes. Interaction with the browser-based modeler is as simple and easy as dragging and dropping palette icons into the design area. Business users can use this tool as a template to define the high-level flow of the process and then define the rules, routing conditions, escalations and exceptions for their organization’s processes. And the process modeler features sophisticated validation and error checking tools to help inexperienced designers create functional processes.

### Conclusion

Used effectively, BPM creates competitive advantage and delivers real ROI by reducing costs, streamlining processes, and increasing operational efficiencies. But as companies implement BPM-based software, many are realizing the limitations of traditional BPM solutions. Today’s business users require applications that do more than automate simple departmental processes. They need context-sensitive applications that deliver relevant information in the right context as processes unfold, and user-friendly applications that deliver collaborative tools to facilitate team-driven processes.

The emergence of enterprise BPM suites marks an impressive forward leap in the development of BPM technology. Designed and architected to accelerate the development and deployment of powerful process-centric, context-driven business applications, enterprise BPM suites enable decision makers to continually optimize their processes, which greatly enhances enterprise agility and performance. ■

Appian is the first business process management (BPM) company to combine process, knowledge, and analytics capabilities in a comprehensive suite. Extending the value of existing systems, Appian’s award-winning software aligns business strategy and execution, delivering greater operational control over strategic business processes. Founded in 1999 and headquartered in Vienna, VA, Appian has received numerous accolades and awards for technology and business leadership, and was recently named the sixth fastest growing software company in the 2004 *Inc.* 500 ranking of the fastest growing private companies in North America. Appian’s customers include Fortune 500 companies, government agencies, and non-governmental organizations. For more information, please visit [www.appiancorp.com](http://www.appiancorp.com)