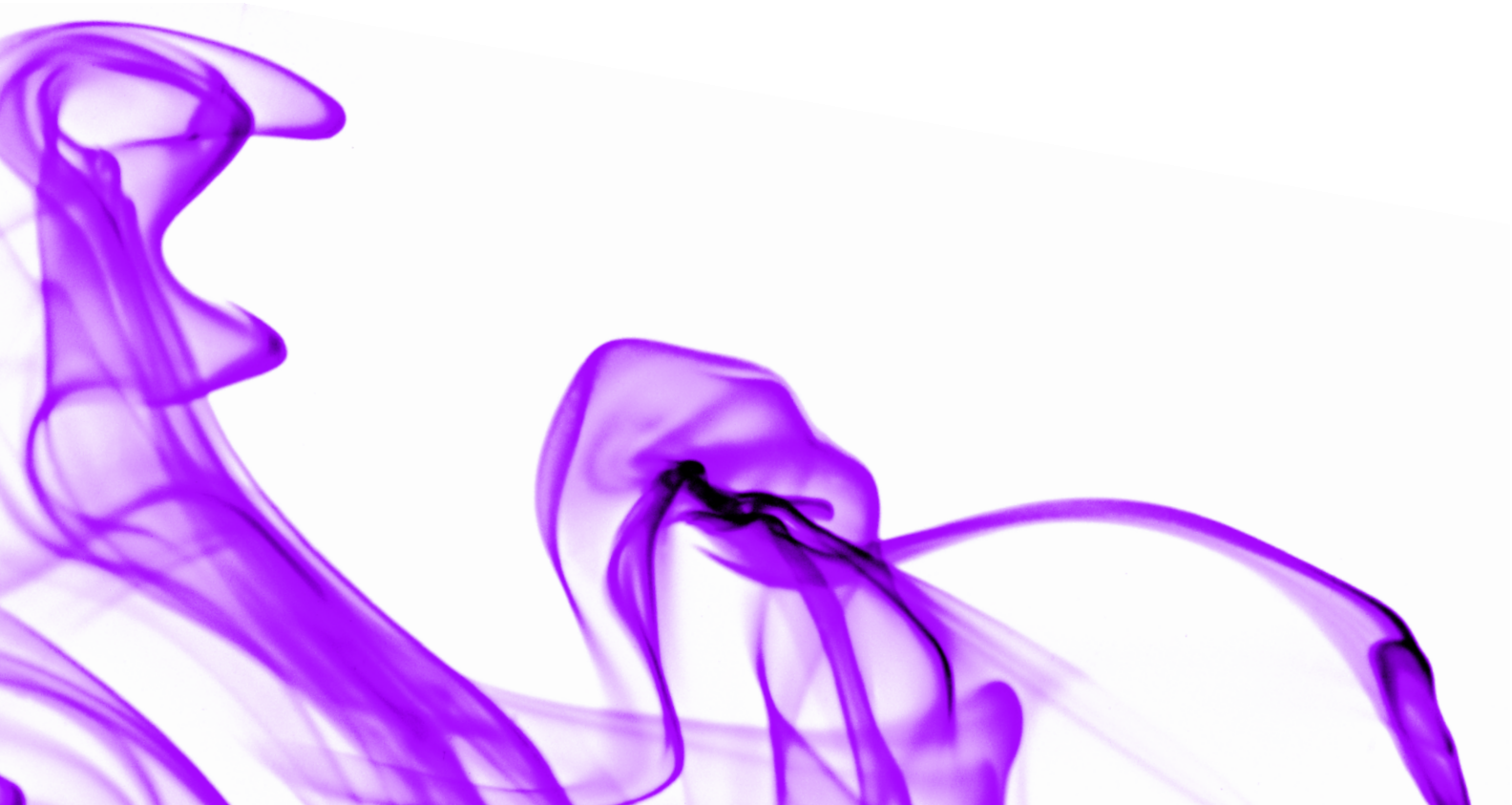
BEA White Paper

Innovating with Dynamic Business Applications



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Executive overview

In our fast-paced business environment, customer preferences, business models, enabling technologies and regulations change quickly. Organizations must anticipate change—even embrace it—if they are to remain leaders in their industries, improve operational excellence, increase customer focus, and expand profitable relationships. Packaged applications and inflexible architectures that limit access to critical information make it even more difficult to respond quickly to competitive challenges and market dynamics. People need more flexibility, freedom and real-time power to turn business ideas into innovation. They need applications and processes that are built for change and designed to work the way they work.

Dynamic business applications are built to work the way business users perform tasks, with inherent collaboration and information access, in components that can be reused, shared, and aggregated. Dynamic business applications enable new levels of agility, competitive advantage, process optimization, and productivity. They are adaptable in real time to situational changes, are highly interactive and collaborative by design, and can quickly be assembled with data sources from inside and outside the business. With dynamic business applications, the people who define the business now have the freedom and the real-time power to turn business ideas into business innovation.

BEA WebLogic and AquaLogic technologies can be combined to create an open, rock-solid platform for collaborating, building, deploying and managing dynamic business applications. The platform simplifies how business, IT and users collaborate to deliver dynamic business applications that embrace change and accelerate innovation.

Capturing change is critical

Today's business environment is one of extreme competition with the spoils going to those companies that can adapt their businesses at the speed of change. But agility is not enough; companies must also provide a foundation for managing change and accelerating time-to-value, to avoid costly and chaotic responses that can capsize their businesses. They must redefine themselves to embrace change if they are to lead their industries, improve operational excellence, increase customer focus, and expand profitable relationships. As Pulitzer Prize-winning author Thomas L. Friedman stated in *The World is Flat*, "The companies that have managed to survive and grow today are those that are most prepared to change. They are the ones that recognize—faster than their competitors—everything new that the flattening of the world enables and everything new that it enjoins and are the first to develop strategies to exploit the new possibilities and to cope with the new requirements."[1]

The time to do this is now. Your business success depends upon it. Market leaders in virtually every industry are already redefining how their businesses work by adopting social computing technologies, automated business processes, virtualized datacenters, and software composed as services. People increasingly personalize their online experiences and determine how they interact with their environment and the people around them. Organizations that use Web and social computing technologies to establish valuable trusted relationships can build a new brand in a matter of months using viral marketing techniques. Businesses that can streamline their supply chains with demand forecasting and just-in-time fulfillment can move into new markets more quickly than ever before. Companies stuck with rigid processes based on yesterday's packaged applications can lose out.

1. Friedman, Thomas L.; The World is Flat: A Brief History of the Twenty-First Century (Picador/Farrar, Straus and Giroux, New York, NY, 2007), Pg. 442.

Coping with increasing demands on IT

Organizations interested in continually evolving their businesses put IT in the stressful position of having to balance changing business requirements with evolving regulatory requirements while keeping existing systems running. Organizations must reduce this stress and improve the collaboration among all business stakeholders.

The central problem for IT is that today's packaged applications were built to standardize core business functions—such as finance, human relations, procurement, and customer relationship management (CRM)—and were not designed to be changed. Packaged applications force people to map isolated pools of information and functions to their tasks and processes, and they force IT to spend too much budget to keep up with evolving markets, policies, regulations, and business models.

Businesses need to innovate beyond these packaged applications to gain a competitive advantage. While enterprises spend more than $100B (on aggregate) every year on packaged applications, only a third is spent on well-known enterprise resource planning (ERP) applications such as Oracle or SAP; the rest is for non-commodity, highly specialized and sometimes industry-specific applications.[2] In spite of this effort and expense, most organizations remain discontented with these applications, which are often unwieldy and inflexible. A Forrester survey conducted in September 2006 revealed that there is "deep-seated dissatisfaction with business applications because they were inflexible, didn't address processes that crossed business functions, and didn't match the business' requirements."[3]

To innovate, businesses need applications that can address highly specific and specialized requirements. At the same time, these new applications must be standardized, integrated with their infrastructures, distributed throughout their enterprises, and flexible enough to be constantly changed. The prototypical organization of 2008, as Friedman points out, must build flexibility into its IT infrastructure that enables IT to accommodate changing business requirements faster and inexpensively.

Improving business efficiencies and agility

After a decade of advances in business process management (BPM) technologies, it is now fairly easy to automate and streamline processes that are structured, predictable and stable. The problems arise in the gaps between these structured processes and between data silos, where manual intervention is required. In a recent study by Aberdeen Group,[4] more than half of the 125 executives surveyed reported that manual intervention was necessary to compensate for missing functionality in enterprise applications used for business processes. A wide range of collaborative and social process activities—emails, documents, hallway discussions—fall into these gaps.

Employees fill these gaps with unstructured processes and know-how: they know how to context-switch between disparate applications to get their jobs done. But these "processes in the head" are very hard to certify for compliance, hard to change, and much of that knowledge walks out the door as employees change jobs. In today's information economy, organizations must harness these unstructured processes and knowledge to improve productivity and gain competitive advantage.

2. "Worldwide Packaged Applications 2007-2011 Forecast and 2006 Vendor Shares: 2007 Reference Guide November 2007", IDC, Doc # 209329.
3. Forrester Research, Inc., "The Dynamic Business Applications Imperative" by John R. Rymer and Connie Moore, Sept. 24, 2007.
4. "Aligning IT to Business Processes: How BPM is Complementing ERP and Custom Applications," Survey of 125 IT professionals, Aberdeen Group, May 2007.

Balancing agility with control

Enterprises need systems that can help leverage assets, expand capabilities, drive new levels of customer service, and move multilaterally into dynamic markets. The people who define the business—the analysts, architects, engineers, sales force, and employees—need more freedom and real-time power to turn business ideas into innovation. They need applications and processes that are built to be changed and designed to work the way people work.

To acquire this freedom and power, business and IT must collaborate efficiently to respond quickly. The trick is to enable the business side to make changes in a governed manner while reducing its reliance on IT. As businesses collaborate between departments and organizations, complexity will increase as the number of participants, services, processes and applications grows. This new level of business participation demands new enterprise security and governance requirements. Businesses, if they are to succeed in today's environment, must make collaborating smoother and more integrated with their existing infrastructures.

Dynamic business applications provide a medium for IT and business to work better together. BEA's WebLogic and AquaLogic technologies work together as a unified, integrated platform for dynamic business applications, so that the people who define the business and support its systems can collaborate better with the freedom and real-time power to meet their business imperatives and turn ideas into business success.

Dynamic applications: The beginning of "Business I Define..."

Dynamic business applications enable business users and analysts to define the business aspects of their applications and processes in collaboration with architects, developers and IT. Dynamic business applications are adaptable to business context, information rich, and built for change. Built using component services and driven by business processes, dynamic applications are more flexible and adaptable to changing business requirements. According to the Forrester report cited previously, dynamic business applications should be businesses' top priority for the next five years.

Dynamic business applications are significantly different from packaged or custom applications—they are combined from standards-based services, and reused instantly to meet business needs. Highly interactive and collaborative, dynamic applications are context-sensitive to processes, activities, and user roles and expertise. Business context ensures that workflow and information relate to people based on their roles, business goals, location, time, device, and other factors.

Dynamic applications are also rich with graphics, visualizations, images, sounds, and videos. Designed for the way people work and built to be changed as needed, dynamic applications may be built on the fly and used to create enterprise mash-ups for better access to data. Business users have a powerful "sandbox" for defining new business or revenue models and simulating, testing and refining their approaches without incurring costs or involving IT. As a result, dynamic business applications enable new levels of agility, create compelling user experiences, deliver competitive advantage, and generate additional productivity.

Built for constant change

Dynamic business applications enable appropriate business changes and evolve at a pace set by the business while continually preserving process integrity. They encompass business rules that enable the application itself to adapt to variable conditions. While the IT department manages these rules and core policies, business users can define and change them.

IT has traditionally been responsible for developing and creating applications. Now, business users collaborate on projects with information from different sources, and build social interactions with customers and partners, without help from IT. For example, marketing professionals can determine the rules for new customer promotions built upon an organization's best practices. With this approach, the aspects of the business most likely to change are under the control of business users, who can change rules without programming. This is also true of underlying business processes: the aspects most likely to change are under the control of business analysts, who can now be more involved in the application lifecycle process—working together with architects and developers.

Dynamic business applications are built from services that can be changed monthly, weekly, or even daily in terms of processes, data, and interface. These underlying components can be reused, shared, and aggregated into situational applications that bring together the expertise, processes and data needed to achieve specific time-sensitive goals—without programming. Business users can swiftly put together mash-ups of live data to forecast new marketing promotions or analyze customer trends. Product managers can assemble dashboards to monitor and measure the profitability of new products and marketing campaigns. Rather than constantly switching between homegrown spreadsheets and the idiosyncratic interfaces to back-office systems, the business user can automatically mash together data from the back-office systems and databases, and present that data in different ways according to their needs. As a result, the organization can move quickly to take advantage of market opportunities, make immediate changes to improve profitability or avoid costly mistakes, and react swiftly to competitive threats.

Designed the way people work and interact

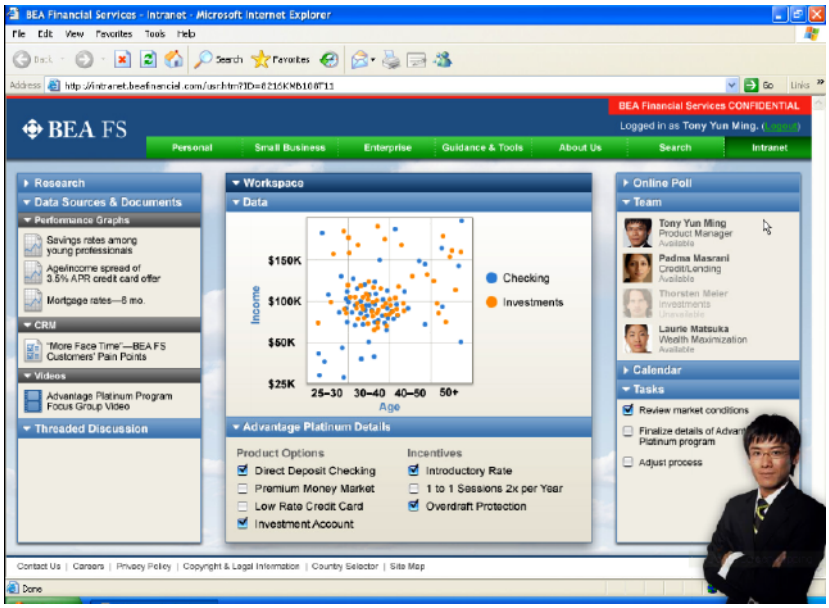
Dynamic business applications behave the way people perform tasks, with ingrained collaboration and information access. They put the user's role (salesperson, business manager, business analyst, architect, IT manager, etc.) at the center of each experience, bringing together tools and information in the context of that user's needs. Rather than manually integrating information and actions across a dozen different applications and tools, dynamic applications present all the information and tools in a seamless, contextual environment tailored to a person's role or task at hand.

The business user's work is the organizing structure for a workspace that enables the manipulation of transactions, business processes, content, unified communications, and social interaction functions. Teams can dynamically collaborate in an ad hoc fashion with a unified workspace, rather than figuring out how to use separate collaboration tools. The workspace captures every interaction and change to processes, data, user experiences, and rules.

Processes can be tailored to work the way people work, knowledgeable of the context, anticipating responses and correcting errors if they occur. For example, a process that requires a user to confirm an inventory level in SAP might include relevant elements of the SAP ordering system, automatically injected into the interface hosting the process task, so that the user doesn't have to leave the process to access another application.

Figure 1

The workspace for dynamic business applications is tailored to a specific user's role to increase productivity.



Social computing technologies can improve the way information is discovered, consumed, and delivered. Simpler, more accessible Web-based tools encourage participation in process design and modification from anywhere in the organization, even outside the firewall. People with little or no technical training can create Web sites, share photos and video, collaborate on documents, and create simple applications by assembling services. Within the enterprise, social computing tools provide a breeding ground for value creation, removing barriers to collaboration and allowing business users to create solutions to problems as they arise—with IT as moderator, not sole creator. By nurturing collaboration and participation between business stakeholders, and improving their access to information, an organization can drive higher levels of customer service and increase productivity throughout the enterprise.

Participants	Benefits
Business users	Greater freedom to assemble situational applications, change the business aspects of processes, and orchestrate social interactions that can drive higher levels of customer service and value creation
Business analysts	More productive collaboration for modeling, building, and modifying business processes to respond quickly to change and drive new initiatives
Architects	Saves time orchestrating the assembly of services required to satisfy business requirements, and provides a higher level of architectural control over what is built
Developers	More productive environment for assembling and modifying existing services and building new services to increase time-to-market
IT Operations	More effective control over the deployment and consumption of services and better compliance with corporate standards

Figure 2

By composing dynamic business applications in a collaborative environment, business users, analysts, architects and IT operations can quickly and efficiently deliver timely business solutions to meet any challenge.

Inherently collaborative

Dynamic business applications are created differently than traditional applications, with less dependence on IT. Business users have greater freedom to create mash-ups and situational applications, change business rules for promotions, and orchestrate social interactions that can drive higher levels of customer service and collaboration. Business analysts have a more productive collaboration environment for modeling, building, and modifying business processes. Architects save time orchestrating the assembly of services required to satisfy business requirements, and gain a higher level of architectural control over what is built. Developers can be more productive in assembling and modifying existing services and building new services. IT operations can focus on budgeted priorities while maintaining better control over the deployment and consumption of services and better compliance with corporate standards.

All of this collaborative activity is controlled by a structured workflow combined with a service registry and repository to manage service assets and policies, to make sure everything is done in compliance and alignment with the business. Throughout the application lifecycle each participant can gather appropriate analytics in a view customized for that participant's role, which provides visibility into the impact of their work on the business.

Flexibly hosted on premise or off

Businesses don't want to be encumbered by their infrastructure; they want to be freed by it. The flexibility to host applications either with an off-premise provider or on an on-premise server gives enterprises the ability shift power to business units, democratizing tasks that would traditionally require IT involvement. The rising emphasis on simplifying software management and improving service levels is accelerating the adoption of this software-as-a-service (SaaS) delivery model. According to a recent business survey by Saugatuck Technology,[5] at least 65% of businesses will have deployed at least one SaaS application by 2010—with the U.S. achieving in excess of 75%. Early SaaS success in markets such as human resources, customer resource management and Web conferencing demonstrate the benefits of lower total cost of ownership (TCO), faster deployment time and wider adoption across the enterprise.

Dynamic business applications support this trend. They are inherently flexible for deployment as on-premise or off-premise hosted services. Businesses can develop dynamic applications in-house and host them on-premise, or off-premise with a hosting service. These dynamic applications can be integrated with SaaS offerings from software vendors as part of a business process or simply mashing up data inside and outside the company to create a situational application. In addition, application-metering capabilities enable billing as a 'unit of use' across departments or business units to provide higher levels of control and management. Software vendors can readily build dynamic applications that are delivered to the business via SaaS with all the capabilities required to build off-premise, SaaS applications (such as multi-tenancy, provisioning, security and metering).

5. Saugatuck Technology, SaaS Survey Research Jan. 2006 (n=156) and Jan. 2007 (n=250)

BEA platform for dynamic applications

BEA has unified its rock-solid infrastructure and its middleware product families to work as a platform for collaborating, building, deploying and managing dynamic business applications. The platform unifies and transforms how business, IT and users collaborate to deliver dynamic business applications for rapid innovation.

The characteristics of this unified, simplified, and integrated platform work together to benefit organizations that need to create innovative products and services, strengthen and expand profitable relationships, improve operations, and reduce costs:

Collaborative. The platform simplifies and extends collaboration to encompass business users, analysts, architects, developers and IT operations for rapidly responding to change. Collaborators can work with each other in ways that feel natural, not dictated by IT or by packaged applications, creating mash-ups and situational applications as needed. The platform delivers all the capabilities—search, tagging, book-marking, social profiling, community-building, Web publishing, information discovery, expertise location, and activity analytics—that enterprises need to bring people, systems and processes together. It enables faster access to multiple data sources, and views of data can be customized rapidly for a given role to enable organizations to deliver optimal user experiences. As a result, organizations can improve access to timely, relevant and accurate information to support better business decisions.

Adaptable. The platform provides a foundation for abstracting complexity from business applications into bite-sized, reusable components for rapid assembly and easy modification. By enabling business analysts and users to change process and business rules without programming, the platform places more control in the hands of the business to roll out changes with minimal complexity and cost. Its comprehensive end-to-end governance of the dynamic business applications lifecycle gives IT the confidence to empower business users to make changes without fear of losing control.

Unified and integrated. The platform offers a unified experience for designing business processes and building, deploying, managing and monitoring dynamic business applications, simplifying the lifecycle and increasing productivity. With the combination of a central repository of services, shared metadata, and a structured workflow, the platform enables tight collaboration that brings order to chaos, minimizing the duplication of services across business units, divisions and projects. Its Service Assembly Modeler (SAM) unifies the representation of services and composites to increase visibility and control, reduce compatibility risks, and improve productivity, business alignment and governance.

Resilient. The platform is built to last: it is based on BEA WebLogic and BEA AquaLogic technology, the most rock-solid enterprise foundation on the market today, offering superior levels of reliability, scalability, performance, and security. WebLogic offers high-performance real-time processing, event-driven processing, and virtualized hosting for scalability, consolidation, and cost-savings. The demand on individual services can vary with the assurance that the platform continuously and automatically adapts to these varying demands. The platform also enables IT to implement policies across all elements of the enterprise, and improves visibility into services consumption and the impact on the business. It also improves risk management capabilities by exposing only relevant data sources to individuals, and only with appropriate authorization.

Building on the reliable BEA WebLogic and BEA AquaLogic foundation

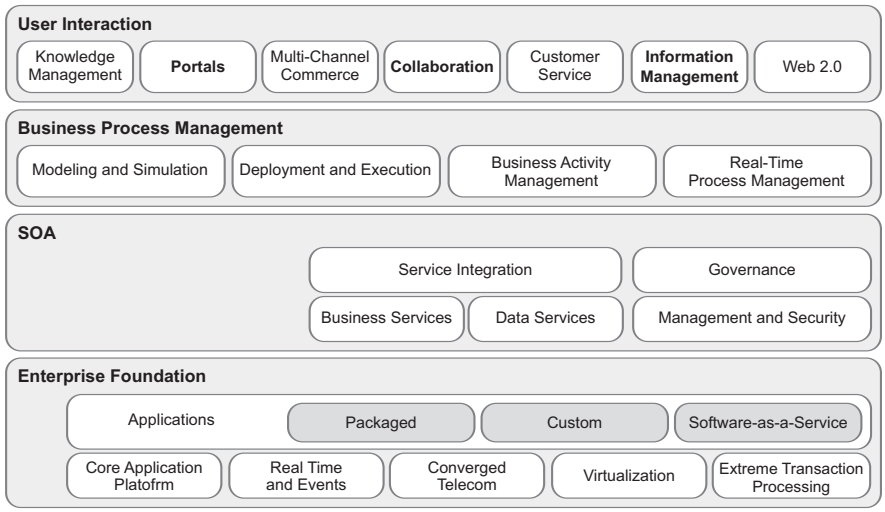
The dynamic business application platform combines the power of the rock-solid BEA WebLogic foundation with the BEA AquaLogic technologies, including business process management (BPM), user interaction, and social computing technologies to create the first dynamic business application platform. Companies can use this platform to model and configure new business processes, portals, collaborative communities, mash-ups, and applications delivered as services.

Enterprise Foundation. A foundation for dynamic business applications must be completely reliable, secure, highly available, and high-performing for mission-critical activities; flexible enough to be constantly adapted and extended for changing conditions; self-adapting to respond to varying demands on services; and scalable to support business growth. At the core of this platform is BEA WebLogic, the most reliable application server technology on the planet with a decade of market leadership in enterprise-class Java solutions—a combination of reliability and innovation without compromise. Characteristics of the foundation layer that are essential for dynamic applications include:

- Virtualization, which improves hardware utilization and lowers hardware, license, and operating costs
- Dynamic provisioning, which automates the management and control of applications running on a virtualized infrastructure
- Multi-tenant security, metering and billing, and flexible hosting choices
- Event processing, which provides a sense-respond model for reliably responding to events and executing appropriate business processes, enabling an enterprise to instantly act upon and process enormous volumes of data in real time
- Real-time processing, which provides a high-throughput, low-latency Java runtime environment for performance-critical, real-time applications with response times in the milliseconds
- Transaction processing with BEA Tuxedo, which runs the most demanding transactional systems in the world from financial trading to airline reservations—required for running high volume applications across distributed, heterogeneous computing environments.

Figure 3

The dynamic business application platform combines a rock-solid enterprise foundation and an extremely flexible services-oriented architecture with business process management, collaborative user interaction, and social computing technologies.



Services (SOA). Over the last several years, many organizations have turned to Service-Oriented Architecture (SOA) to build simpler, more reusable and more flexible business services on top of disparate, siloed and redundant IT systems. Conceptually, SOA enables IT to respond rapidly to new business requirements by composing new solutions from existing business services. Using pre-built reusable services greatly reduces the time and costs associated with system integration. SOA dynamically connects an organization's data, applications, and processes by creating loosely coupled service components that mask the underlying technical complexity of the IT environment. This foundation creates agility because you can move these assets around and combine them quickly and easily to enable faster business response and deliver an optimal user interface.

To deliver on the promise of SOA, it is necessary to exercise the appropriate governance, management, and security measures. The ability to control when, where, how, and by whom services are created, deployed, and consumed is essential for controlling complexity, making informed investment decisions, managing change, and measuring return-on-investment. BEA AquaLogic technologies include:

- Real-time, integrated, reusable information as a service
- Universal backbone that connects, mediates, and manages interactions between heterogeneous services
- Pervasive governance framework for optimizing and regulating services consumption based on policies managed by IT that can be defined by the business
- Consistent security enforcement across numerous, decentralized systems.

Business Process Management (BPM). The BPM layer unifies support for the entire process lifecycle, from modeling and execution to measurement and optimization, shielding business process logic from underlying implementation layers. Synthesized around the processes that are core to the value of a specific organization, BPM empowers business users to quickly develop dynamic applications according to the requirements of the day.

The BEA AquaLogic BPM Suite delivers a comprehensive, integrated BPM platform with support for the modeling, implementation, execution, and monitoring of end-to-end business processes. The human tasks that typically fall into the gaps between structured processes can be explicitly connected to BPM activities and articulated by business analysts within the process model to streamline operations. When collaboration is required at any point of a structured process, BEA AquaLogic technologies enable process participants to create and manage ad hoc tasks, or attach collaborative workspaces to individual steps in process.

User Interaction. Social computing software and Web 2.0 capabilities are important ingredients for helping businesses revolutionize the processes that matter most: driving new levels of customer service, launching products to market faster, and ultimately seeing more substantial financial gains. BEA AquaLogic technologies deliver social computing and Web 2.0 capabilities—including blogging, social search, collaborative book-marking, widgets, wikis, and mash-ups—to the enterprise, with the security, governance and management business computing requires.

Simplifying the application lifecycle

In the arms race to be more innovative, businesses need a fast, flexible, and simplified way to collaborate on the assembly and modification of dynamic business applications. BEA is focused on making non-commodity business applications and processes easier to build and change. The BEA WorkSpace collaborative environment simplifies the application lifecycle from design and assembly to testing, deployment, and monitoring.

For example, a bank is under competitive pressure to ensure that new promotions and products are featured at the right time, in the right channel, and offered to the right customer segments. With dynamic business applications, the bank is able to launch promotions and new products faster than ever, in close collaboration with IT. Participants collaborating in the lifecycle can gather appropriate analytics in a view customized for that participant's role. The roles are as follows:

Business users combine services into mash-ups. A product manager can create a situational application by gathering the people, experts, tasks, information and data. This can be a collaborative activity, using social computing tools to communicate with colleagues and coordinate the information and process steps needed to bring a new product or promotion to market. Later, the product manager can change things, such as the demographics for specific promotions, by simply adding a new rule to the promotion engine specifying the precise demographic for the specific promotion. As the product or promotion rolls out, the product manager can automatically track its success. Behind the scenes, business processes coordinate the steps, assembling pre-built services into an enterprise mash-up.

Figure 4

A product manager can assemble a situational application using pre-built services and change business rules for processes, while an underlying structured workflow coordinates the steps.

Business analysts define processes. Analysts are empowered to design the business and define its processes and rules using familiar modeling tools. Analysts can then use the information from the models, together with operational or simulation metrics, to collaborate with architects. Analysts can view operational metrics associated with how business processes are used, in order to identify where processes can be optimized.

Architects assemble services and exercise control. Architects can orchestrate the assembly of services required to satisfy business requirements and maintain architectural control over what is to be built. This information can then be used in collaboration with business analysts to portray the complexity associated with the business requirements—and justify funding. Architects may also use this information to collaborate with the developers and IT Operations to form an understanding of what needs to be created and how it should be deployed. Architects can view architectural compliance, asset usage, and policy compliance information to help identify where optimizations need to occur.

Developers combine service components or build new ones. Developers can assemble and modify existing services and build new services using whatever standards-based tooling platforms are appropriate. An underlying workflow can trigger governance issues if, for example, a developer implements something that conflicts with or is already handled by another service.

IT Operations deploys, maintains, and monitors. IT can centralize assets and control sharing for consistency and instant dissemination, reducing software maintenance and upgrade costs. Operations can also manage the consumption of services, and Operations gains more visibility into the operational and performance metrics associated with the different components to identify where to make optimizations in the infrastructure.

BEA WorkSpace provides a central repository to drive governance, manage dependencies, and control dynamic behavior with policies. The combination of the central repository, shared metadata, and structured workflow enables tight collaboration, and enables the packaging of processes, which can be assembled and changed by business users. It enables the participants to maintain visibility and control over changing business processes, monitor business activities and the health of the infrastructure, set business policies, and manage service-level agreements.

Taking the next step

BEA is demonstrating how the combination of WebLogic and AquaLogic technologies work together as a dynamic business applications platform that unifies and transforms how business, IT and users collaborate for rapid innovation. It radically simplifies the lifecycle of modeling, deploying and managing dynamic business applications to efficiently leverage assets, rapidly expand and adapt capabilities, and quickly respond to changes in business environment.

The convergence of SOA, BPM, and social computing technologies is a perfect storm to break through the logjam of process inefficiencies and inflexible applications and redesign your competitive differentiation with dynamic business applications. Take advantage of this perfect storm and visit the *Dynamic Business Applications* site at *bea.com*. For more information and white papers on specific solutions and BEA products, visit the *Solution* site at *bea.com*.

About BEA

BEA Systems, Inc. (NASDAQ: BEAS) is a world leader in enterprise infrastructure software. BEA® Enterprise 360°, the industry's most advanced SOA-based offering, is a comprehensive approach to delivering business results that includes technology, professional services, best practices, and world-class partners. Information about how BEA helps customers build a Liquid Enterprise™ that transforms their business can be found at *bea.com*.

Join the BEA community

At BEA, we understand that developers need different kinds of resources than IT managers. And that architects face different challenges than executives. That's why we've created four unique communities that give you exclusive access to a formidable group of your peers, to a world of shared thinking, and to the kind of meaningful information that can make you more effective and more competitive. To join one or more of the BEA communities, simply register online at *bea.com/register*.

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