

Business Integration with SOA

A Revolution in Business Agility



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Introduction

Every day, businesses struggle with agility: being more nimble than competitors, satisfying ever-increasing global customer expectations, and accommodating new compliance mandates. This constant change calls for flexibility, efficiency, and automation across all the processes that drive daily business activities. Wouldn't it be nice if your existing information technology (IT) assets supported your actual business processes? And better yet, if you knew where to focus new IT investment for maximum return?

You want to use IT to help attain the businesses agility that will give you a sustainable competitive advantage. Achieving this agility is the goal of business integration, which combines business process management and a service-oriented approach to information-systems integration. Increasingly, organizations want the ability to map out solutions to their complex business problems while giving IT flexible components to support the resulting business requirements. However, while straightforward in concept, implementing business integration has proved challenging in practice.

The two key challenges to successfully implementing business integration have involved effectively bridging the business and IT worlds and, second, providing flexible yet robust infrastructure to support the bridge. Traditionally, business integration approaches were either top-down or bottom-up. The top-down approaches dissected business processes further and further until arriving at specific computational operations—but unfortunately, these operations often bore little resemblance to existing software capabilities. Bottom-up approaches built up more and more abstract computational operations—but these operations often bore little resemblance to coherent business processes. To make matters worse, the infrastructure for linking individual operations was so rigid that enterprises couldn't adapt their business and IT mappings quickly enough to be competitive.

Business process management and Service-Oriented Architecture (SOA) help to overcome both of the above challenges by giving businesses the tools to map out their processes conceptually and giving IT departments the tools to effectively map existing services, data, and applications to those requirements. Together, business process modeling (BPM) and SOA offer a unifying conceptual unit of work for both the business and IT sides of a company: *the atomic business service*. In this model, the business decomposes processes into atomic business services while IT builds up existing assets and new components into atomic business services, and the two meet in the middle. In addition, they are connected by a flexible backbone that aids adaptation: *the enterprise service bus* (ESB). This infrastructure allows companies to quickly add new services, swap in external services for internal services, transition from older to newer services, rearrange the sequence of services, enforce governance policies, and monitor service execution. In other words, business services can now become plug-and-play.

Successfully implementing business integration requires a complete platform. Business process management (BPM) suites enable business people to express each process “story,” such as “order fulfillment.” Service-enabled data integration infrastructure enables IT staff to supply the necessary “nouns,” such as “customer” and “product.” Service-enabled application integration infrastructure allows IT staff to supply the necessary “verbs,” such as “purchase” and “ship.” Finally, an ESB connects the nouns and verbs into the desired story, and also enables the company to continuously edit this story.

According to Forrester Research (ICBPMS Wave Q406), there is a strong link between SOA and BPM. A recent panel survey conducted by Forrester showed that 92 percent of respondents who were implementing SOA also felt that BPM was important for their organization's future. This link is important because the current generation of integration and BPM products reside on an SOA foundation and can support a full range of SOA functionality. The bottom line is that you don't have to implement SOA before you implement BPM; you can adopt them simultaneously.

One tremendous advantage of business integration is that enterprises can follow different paths to implementation, depending on their respective situations and needs. One could start with BPMS if the business is driving the effort to improve visibility, control, and agility. Others could start with data or application integration if those capabilities provide the most immediate ROI for the problems at hand. Finally, some could start with an ESB where that infrastructure fulfills a common need across existing integration projects. No matter where companies begin, they can always gracefully expand toward a complete business integration portfolio combining SOA and BPM. One size does not have to fit all, and to support each customer on its unique path, BEA provides a comprehensive set of products and expertise that can extend the value of existing infrastructure and applications.

Business integration with SOA

Methodologies for attempting to align IT assets with business goals date back at least to the Information Engineering concept developed by Clive Finkelstein and popularized by James Martin more than 25 years ago. Most early approaches assumed a top-down-only procedure where enterprises derived their desired IT capabilities by dissecting their current business models. The result was called “Blank Slate Syndrome”—a list of exceedingly specific requirements that rarely matched the features of any existing systems. The only way to deliver the promised alignment was to make a massive investment in new software development. Of course, any changes to business goals snowballed into a new set of capability gaps and required another chunk of investment.

In response to the limited success of top-down approaches, many companies tried a bottom-up-only procedure, creating a bunch of point solutions that rarely supported the coherent execution of an entire process. This caused “New Stovepipe Syndrome,” meaning that individual projects used integration tools to assemble an existing set of low-level software functions into more abstract operations that matched immediate business needs. The only way to deliver the promised alignment was to embark on a never-ending series of discrete integration projects. Of course, every new project's requirements resulted in a new stovepipe with its associated development effort, so instead of facing an ever-accelerating treadmill of business modeling, companies faced an ever-accelerating treadmill of integration projects.

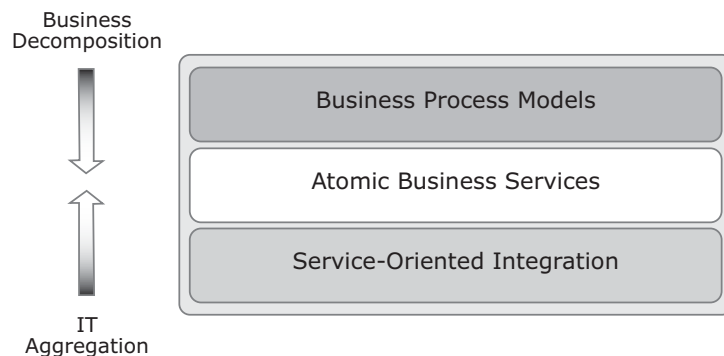
SOA-based business integration lets companies off these treadmills. SOA's benefits to business integration stem from two innovations: (1) a conceptual unit of work that unifies the business and IT, and (2) a backbone that flexibly mediates among the units of work. The unifying conceptual unit of work here is the *atomic business service*. The basic concept of a service makes sense to both the business and IT sides; to the business, it's a collection of similar tasks, roughly corresponding to what a small department such as “payment processing” would have provided in the old bricks-and-mortar world. To IT, it's a collection of related functions, roughly corresponding to what an application module such as “payment processor” would have provided in the old client-server world. Thus, there's already a foundation for establishing a common ground based on business services.

From the business perspective, an “atomic” business service is the lowest-level service that makes sense to it, without imposing any particular IT-level architecture or design. From the IT perspective, an atomic business service is the highest-level service that makes sense to IT, without imposing any particular business-level process flow. Obviously, these definitions are flexible enough to allow for varying interpretations depending on the particular company and industry. For example, a manufacturing company may consider “payment processing” an atomic business service, but a third-party payment processing company will almost certainly embrace a lower level of abstraction as “atomic.” Also, highly information-intensive industries such as financial services will adopt finer-grained atomic business services than less information-intensive industries, such as construction. This flexibility in abstraction level is the beauty of business services. Each company can develop its own conventions, and even adapt those conventions over time, without breaking the paradigm.

Figure 1 illustrates how this conceptual unit of work bridges the gap between the business and IT. The business disaggregates its business process models downward toward the atomic business services layer. IT aggregates software assets upward toward that layer using service-oriented integration. They meet in the middle and negotiate a consensus view of the necessary atomic business services.

The second innovation behind SOA-based business integration is the ESB, which provides the mechanism for continuously adapting the portfolio of available services to accommodate shifting needs. No service portfolio is ever perfect for every situation. Rather than requiring constant updates to constituent services, the ESB can adaptively mediate among them. For example, if two services use slightly different formats for their messages, the ESB can translate between them. Alternately, if a business change in one area requires a new version of a service, the ESB can route requests that require enhanced functionality to the new version while routing requests that assume only basic functionality to the old version. So in addition to providing a common ground for the business and IT, SOA also gives deployed solutions the flexibility to bend without breaking.

Figure 1
Converging on atomic business services.



Arriving at the SOA-based business integration platform

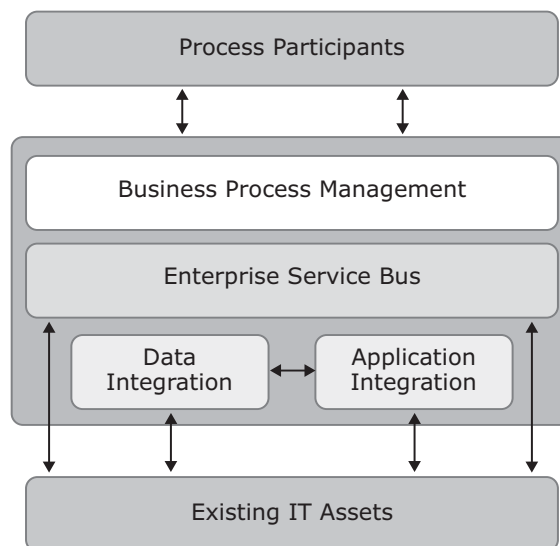
The ESB is by no means the only component of SOA-based business integration; it provides the backbone for an entire platform. Figure 2 reveals the complete picture. The business-integration platform sits between the process participants and existing IT assets, coordinating their efforts. The business process management layer interfaces with process participants, sequencing their tasks and providing the automated assistance available through the ESB. The application and data integration layer interfaces with existing assets, abstracting data and functions as necessary into atomic business services published through the ESB.

Business process management

From the business perspective, the most visible portion of the business integration platform is the business process management layer, which provides process modeling, execution, and management components. The modeling components enable business analysts to write the “story” of each business process using conventions such as Business Process Modeling Notation (BPMN) or Unified Modeling Language (UML). They also enable analysts to document process steps and mock up user-interface screens to illustrate how people will contribute to the process. Finally, they can simulate how automated and manual tasks will flow through the process to help analysts refine the “story” down to an optimized collection of atomic business services.

The execution components translate a process definition into executable instructions and then invoke the necessary atomic business services, usually through the ESB. They also provide a Web-based workspace for people to execute their tasks and manually handle exceptions. Monitoring components track real-time process flow and long-term process metrics to minimize response times to both sudden crises and evolving environments. BEA AquaLogic® BPM Suite delivers all these modeling, execution, and management components in a package with proven reliability, availability, and scalability.

Figure 2
SOA-based business integration.



Application and data integration

From the IT perspective, the greatest effort required to enable business integration goes into data and application integration. To “tell” the business process “story,” IT must supply “nouns” and “verbs” that make sense to the business. Of course, in most large companies, a wide variety of different systems handle different parts of these business-level concepts.

To assemble disparate pieces of business nouns like “customer” from the different data sources that manage them, IT personnel need sophisticated data-integration tools. They must take great care to ensure they respect each source’s differing transaction and security semantics. To aggregate low-level operations from packaged, outsourced, and custom applications into business verbs like “ship,” IT personnel need sophisticated application integration solutions. They must take great care to carefully sequence operations and handle possible exception cases so that all the applications remain in a consistent state. Often data integration and application integration occur in several layers, gradually building up low-level operations until they reach the atomic business service level.

Streamlining these complex integration paths is crucial to achieving the desired agility. That’s why BEA AquaLogic® Data Service Platform and BEA WebLogic® Integration deliver fast deployment of sophisticated data-integration and application-integration services, respectively. Moreover, they also provide the performance and robustness necessary for carrying out critical process tasks.

Enterprise service bus

As discussed above, an ESB is the cornerstone of SOA-based business integration. It’s much more than just a transport; it’s also an intelligent router, translator, policy-enforcer, and monitor. An ESB manages message flows between services, applies management and security policies, and effectively supports SOA governance across the enterprise. In fact, it handles more than just communication among atomic business services—it can also coordinate cooperation among lower-level data and application services. With all this sophistication, it’s important for enterprises to employ best practices when using an ESB, and BEA can help. BEA AquaLogic Service Bus is the leading ESB product precisely because it promotes adherence to these best practices and has the backing of the world-class SOA messaging experts at BEA.

Extending business integration value with a service repository and registry

As the SOA-based business integration infrastructure grows inside the enterprise, it becomes increasingly important to apply consistent policy around how services are developed and deployed and understand what services are available for use, what they can do, and what clients and business processes will consume those services. Business analysts designing new business processes will want to understand what atomic business services already exist that they can use, while architects will want to understand the dependencies that exist on services to determine the impact of any changes. Operations managers will want to understand service-usage and load characteristics to ensure that service level agreement (SLA) commitments are being met. The Service Repository and Registry support these service-governance activities and more by providing design-time and runtime visibility into the business processes and services across the business integration platform.

Adoption models

In earlier approaches to business integration, companies had to adopt a huge platform all at once. Today, because the SOA-based approach puts the business and IT on an even footing, enterprises can transition smoothly from focusing on one area, to several islands of business integration, to a comprehensive implementation. The ability to scale gracefully in breadth of deployment actually increases the return on investment of individual projects. Instead of just amortizing project costs across a single department or activity, companies also get the future benefit of fitting the project into a much larger business-processing ecology.

Start with integration

Often, enterprises with successful information-systems integration projects use them as a jumping-off point towards business integration. The IT department has already realized the benefits of flexible infrastructure and they want to expand that benefit to the business as a whole. A great example comes from the dynamic and process-intensive home loan industry.

A major BEA customer originates and funds sub-prime mortgages. This customer wanted to better handle delinquent loans and decrease its inventory of foreclosed property. Achieving these business goals required that all their loan servicing software modules cooperate more smoothly. With 500 employee users both on-shore and off-shore, as well as up to 1,000 users at partners, the customer required a combination of flexibility and scalability in its integration solution.

They adopted BEA WebLogic® Integration as their standardized middleware platform and are gradually coordinating more and more internal and partner modules as atomic business services made up of IT-centric processes. In their business, efficiency is everything, so decreasing processing times and lowering property inventory have proved to be significant benefits. For a forthcoming loan-origination project, the customer plans to move upwards in the business-integration stack, adopting BEA AquaLogic® BPM Suite as their Business Process Management layer.

Start with an enterprise service bus

Some organizations that have already adopted SOA use their ESB as a starting point for business integration. They usually already have islands of BPM and business integration that they want to make more accessible and robust. Typically, they see the ESB as a horizontal infrastructure requirement rather than a strategic business requirement. However, investing in an ESB will return significant business benefits in terms of agility and responsiveness.

The ESB provides company-wide accessibility to each island of capability. It also delivers consistent policy enforcement including security, higher availability, and tighter service levels. Of course, once such a company has an ESB in place, it can easily connect the islands together and quickly fill in important gaps to achieve business integration. This one-two punch of benefits makes ESBs a solid investment for companies that have existing SOA-based capabilities.

Start with business process modeling

Business process modeling may serve as the most obvious starting point for business integration, and companies that want to improve the execution of important business processes often turn to BPM. To support these efforts in the most flexible and scalable way, exploring SOA for business-integration components is a natural next step. A great example from the BEA customer base is Screwfix, which sells fasteners and associated tools.

In the past, Screwfix had challenges with its replenishment process. Dealers would run out of certain products, resulting in lost sales and increased distribution costs. The existing process and potential improvements all resided in the heads of business analysts. Adopting BEA AquaLogic BPM Suite enabled the company to formalize this knowledge and refine the new process. A proof of concept using the rest of the BEA business-integration platform showed Screwfix it could rapidly align its existing data and application assets with the desired process, and with a clear business motivation in mind, the benefits of a comprehensive approach were immediately clear.

Conclusion

SOA-based business integration can quickly deliver benefits to companies by leveraging existing BPM, integration, and ESB initiatives. Enterprises get substantially better business alignment with only modest extra effort. They can then grow their business-integration portfolio naturally, as specific opportunities present themselves. There's absolutely no need to impose a costly blank-slate approach on the entire organization.

Adopting this organic expansion philosophy means there are no limits to the potential breadth and benefits of embracing business integration within a company. There is a natural network effect for both the business (composing processes out of atomic business services) and IT (aggregating assets into atomic business services) in that new initiatives naturally want to leverage the existing business-service portfolio, and adding to that portfolio increases its value further.

Promoting this effect requires a variety of on-ramps to SOA-based business integration. A complete platform must include BPM, application and data integration, and ESB components that allow companies to start from any point in this solution space. BEA is leading the way in this flexible, SOA-based business integration approach through its industry-leading products, practices, and people.

What to do next?

Whether you're just starting out with business integration, or are already well on your way, BEA has amassed a wealth of information to help you and offers products that meet your needs. A wide variety of resources is available at the BEA SOA Resource Center, including a self-service SOA assessment for analyzing your SOA readiness. Visit the BEA SOA Resource Center at bea.com/soa. BEA offers a similar readiness assessment for BPM at bea.com/bpmready.

About BEA

BEA Systems, Inc. (NASDAQ: BEAS) is a world leader in enterprise infrastructure software. Information about how BEA is enabling customers to transform their business by building a Liquid Enterprise™ 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.



BEA Systems, Inc.
2315 North First Street
San Jose, CA 95131
+1.800.817.4232
+1.408.570.8000
bea.com

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