

A Revolution in Agility: Business Integration Through Service-Oriented Architecture

*An Oracle White Paper
Updated August 2008*

A Revolution in Agility: Business Integration Through Service-Oriented Architecture

Combining business process management and a service-oriented approach to IT management, business integration promotes efficiency and automation across all processes.

Business integration has traditionally posed two key challenges: building a bridge between the business and IT worlds and providing a flexible and robust infrastructure to support that bridge.

INTRODUCTION

In today's rapidly changing business environment, organizations of all types face one common and persistent challenge: how to become—and remain—agile enough to satisfy ever-increasing customer expectations and accommodate new compliance mandates, all while staying ahead of the competition.

The solution is business integration. Combining business process management (BPM) and a service-oriented approach to IT management, business integration promotes efficiency and automation across all processes, ensuring that existing IT assets support actual business processes and new IT investment is focused on maximum return. Although simple in concept, business integration has historically proven difficult to implement; however, with today's service-oriented architecture (SOA)-based approach—which puts business and IT on equal footing—and Oracle solutions and expertise, this doesn't have to be the case. By employing the strategies outlined in this white paper, organizations can ensure a graceful, gradual, and successful transition to complete business integration.

THE CHALLENGE

Increasingly, organizations are looking to IT to give them the tools to map solutions to their complex business problems, which, in turn, means giving them the flexible components they need to support that process. However, this type of business integration has traditionally posed two key challenges: building a bridge between the business and IT worlds and providing a flexible and robust infrastructure to support that bridge. Organizations typically adopt either a top-down or bottom-up approach to the task, both of which have met with little success. The top-down approach dissects business processes to arrive at specific computational operations—many of which bear little resemblance to existing software capabilities. The bottom-up approach, in contrast, builds on more-abstract computational operations to arrive at operations that often bear little resemblance to coherent business processes. To make matters worse, the infrastructure for linking individual operations is often so rigid that organizations can't adapt their business and IT mappings quickly enough to be competitive.

Forrester Research has found a strong link between SOA and BPM. Indeed, a recent survey conducted by the organization showed that 92 percent of respondents who were implementing SOA also felt that BPM was important for their organization's future.

THE SOLUTION

By giving the business side of an organization the tools to map their processes conceptually and by providing IT departments with the tools to map existing services, data, and applications to those requirements, BPM and SOA make business integration possible. Together, they offer a unifying work concept for both business and IT: *atomic business service*. In this model, the business decomposes processes into distinguishable, but minute, business services while IT builds up existing assets and new components into the same—leading the two sides of the organization to meet in the middle. In addition, business and IT are linked by a flexible backbone, called an enterprise service bus (ESB), that aids adaptation. The result is a flexible infrastructure that 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.

IMPLEMENTATION

Successful business integration requires a complete platform, including

- **BPM suites.** These allow each process to be expressed as a “story” (such as order fulfillment).
- **Service-enabled data integration infrastructure.** This enables IT staff to supply the necessary “nouns” (such as customer and product).
- **Service-enabled application integration infrastructure.** This allows IT staff to supply the necessary “verbs” (such as purchase and ship).
- **Aggregator/ESB.** This is what connects the nouns and verbs into the desired story (and allows the company to continuously edit the story).

One tremendous advantage of business integration is that enterprises can follow different paths to implementation, depending on their situations and needs; for example, an organization could start with BPM software if the business side were driving the effort to improve visibility, control, and agility. However, another organization might start with data or application integration if those capabilities were likely to provide the most immediate return on investment (ROI) for the current problems. Finally, ESB could represent the first step for an organization in which infrastructure fulfills a common need across existing integration projects.

Regardless of where a company begins, it can gracefully integrate its business portfolio by combining SOA and BPM.

Regardless of where a company begins, it can gracefully integrate its business portfolio by combining SOA and BPM. One size does not have to fit all, and to support each customer on its unique path, Oracle provides a comprehensive set of products and expertise to extend the value of existing infrastructures and applications.

BUSINESS INTEGRATION WITH SERVICE-ORIENTED ARCHITECTURE

Businesses have been attempting to align IT assets with business goals for more than 25 years—dating back, in fact, to the days Clive Finkelstein developed and James Martin popularized the concept of *information engineering*. Most early approaches to the task employed a top-down procedure wherein enterprises dissected their current business models to derive their desired IT capabilities. The resulting “blank slate syndrome,” however, produced a list of exceedingly specific requirements that rarely matched the features of any existing systems—meaning the only way to deliver the promised alignment was to invest massively in software development. And, of course, any changes to business goals grew into a new set of capability gaps and another substantial investment.

Responding to the limitations of this approach, many companies tried a bottom-up approach instead—leading to a proliferation of point solutions. The trouble with these was that they rarely supported the coherent execution of an entire process and therefore resulted in “stovepipe syndrome”; that is, geographically dispersed companies had difficulty exchanging data from one part of the company with other parts. This meant that individual projects used integration tools to assemble existing low-level software functions into abstract operations that matched only the immediate business needs. And this in turn meant that the only way to deliver the promised alignment was to embark on a never-ending series of discrete integration projects—each of which resulted in a new stovepipe. Thus, rather than reaching a state of constant business modeling, companies found themselves facing never-ending integration projects.

SOA-based business integration solves these problems by introducing two important innovations: a conceptual work unit linking business and IT and a backbone that flexibly mediates among work units. The unifying work unit in this case is the atomic business service—a concept that makes sense to both the business and IT sides of an organization. For those on the business side, this atomic business service represents a collection of similar tasks that correspond to those that a small department (such as payment processing) might provide in the brick-and-mortar world. To IT, this atomic business service represents a collection of related functions that correspond to what an application module (such as a payment processor) might have provided in the old client/server world.

From the business perspective, an atomic business service is the lowest-level service that makes sense—without imposing any particular IT-level architecture or design. And from the IT perspective, an atomic business service represents the highest-level service that makes sense—without imposing any particular business-level process flow. Obviously, these definitions are flexible enough to allow for varying interpretations, depending on the company and industry; for example, a manufacturing company might consider payment processing to be an atomic business service, but a third-party payment processing company would almost certainly embrace a lower level of abstraction as atomic. Also, highly information-intensive industries such as financial services will adopt finer-grained atomic

SOA-based business integration solves these problems by introducing two important innovations: a conceptual work unit linking business and IT and a backbone that flexibly mediates among work units.

business services than less information-intensive industries such as construction companies. 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 work unit bridges the gap between business and IT. The business disaggregates its business process models downward toward the atomic business services layer, while IT aggregates software assets upward toward that layer using service-oriented integration. They then meet in the middle and negotiate a consensus view of the necessary atomic business services.

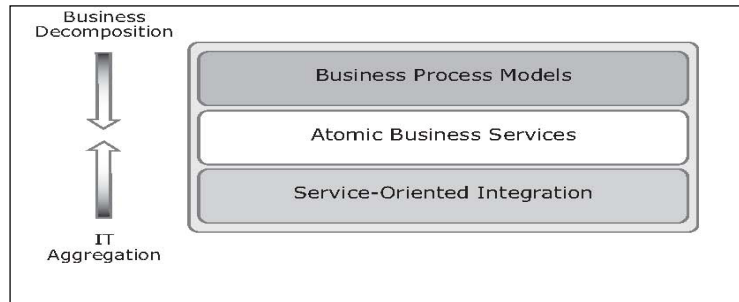


Figure 1: Converging on atomic business services

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 perfect for every situation; however, 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. Alternatively, 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. Thus, in addition to providing common ground for business and IT, an SOA also gives deployed solutions the flexibility to bend without breaking.

In addition to providing common ground for business and IT, an SOA also gives deployed solutions the flexibility to bend without breaking.

THE SERVICE-ORIENTED ARCHITECTURE PLATFORM

Although the ESB isn't the only component of SOA-based business integration, it does serve as the backbone for an entire platform. Figure 2 reveals the complete picture, but in brief this is how the SOA platform looks and works:

- The business integration platform sits between the process participants and existing IT assets, where it coordinates their efforts.

- The business process management layer interfaces with the process participants, sequencing their tasks and providing automated assistance via 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.

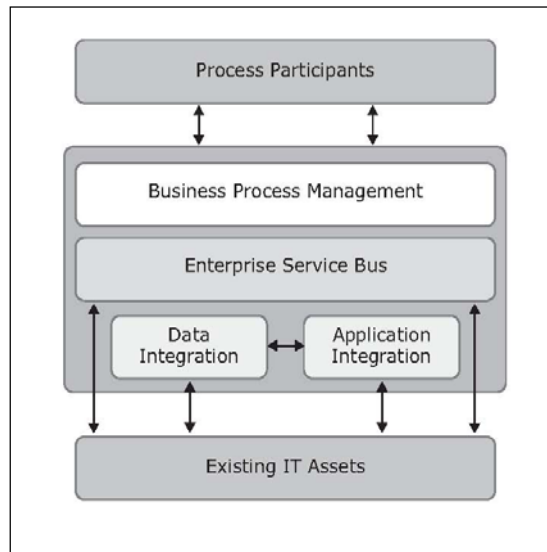


Figure 2: SOA-based business integration

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.

Modeling components allow business analysts to write the story of each business process using conventions such as Business Process Modeling Notation. They also allow analysts to document process steps and mock up user interface screens to illustrate how people will contribute to the process. Finally, these modeling components can simulate automated and manual task flows to help analysts refine the story down to an optimized collection of atomic business services.

Execution components translate a process into executable instructions and then invoke the necessary atomic business services, usually through the ESB. They also provide a Web-based workspace for users 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. Oracle Business Process Management Suite delivers all of these modeling, execution, and management components in a single package with proven reliability, availability, and scalability for change in ownership.

Data Integration

Businesses are powered by information. When accurate, integrated information is delivered in real time, organizations can make sound decisions. Getting the right data in the right place at the right time is the key to enabling such a real-time flow of information.

- **The right data.** The data must not only be appropriate for the use that is intended, but it must also be accurate and reliable.
- **The right place.** The overall information ecosystem consists of multiple operational and analytical systems. Each system needs to leverage and benefit from the data within the other systems, regardless of location.
- **The right time.** Data can quickly become stale. A decision support system that does not get the data in time is useless. A shipping application that does not get order information before cutoff time is not efficient. Getting data at right time—with a latency that is appropriate for the intended use of this data—is one of the most important challenges faced by businesses today.

Oracle offers Oracle Data Integration Suite—a comprehensive data integration offering that provides the right data in the right place at the right time. With uncompromising performance, Oracle Data Integration Suite addresses all data integration needs such as change data capture; data quality; data profiling; and extract, transform, and load. When used in conjunction with Oracle Fusion Middleware, it becomes a central component of an end-to-end IT architecture and provides top-level shared data services across the enterprise.

Enterprise Service Bus

Serving as much more than just a transport, an ESB also acts as an intelligent router, translator, policy enforcer, aggregator, and monitor. In addition to managing message flows between services, applying management and security policies, and supporting SOA governance across the enterprise, an ESB also facilitates cooperation among lower-level data and application services—all of which makes employing best practices essential when using an ESB.

Oracle's ESB offering, Oracle Service Bus, is designed to connect, mediate, and manage interactions among heterogeneous services, legacy applications, packaged applications and multiple ESB instances across an enterprisewide service network. Oracle Service Bus is a core component of Oracle SOA Suite and integrates with Oracle's SOA governance solution for improved enterprisewide SOA governance, thereby promoting adherence to best practices.

Service Repository and Registry

As the SOA-based business integration infrastructure grows within an enterprise, it becomes increasingly important that consistent policies be applied to the development and deployment of services, and that all key parties have a complete

understanding of those services—that is, which ones are available for use, what they do, and which clients and business processes will consume them.

- Business analysts need to understand what atomic business services are available for use in designing new processes.
- IT architects must understand what service dependencies exist so that they can determine the impact of any changes.
- Operations managers need a thorough knowledge of service usage and load characteristics so that they can ensure that service-level agreement commitments are met.

Oracle Enterprise Repository and Oracle Service Registry support these service governance activities and more by providing design time and runtime visibility into business processes and services across the business integration platform.

ADOPTION MODELS

In the early days of business integration, companies were forced to adopt huge platforms as one extensive implementation project. Today, however, SOA has put business and IT on even footing—which means that enterprises can transition smoothly from partial to full integration. In fact, this ability to scale deployment gracefully actually increases an organization’s ROI for individual projects, because instead of just amortizing costs across a single department or activity, companies can fit them into a much-larger business processing ecology. The following subsections outline the approaches organizations can adopt to transition to full-scale business integration.

Integration as the Starting Point

Often, enterprises use successful information systems integration projects as jumping-off points for business integration, thereby extending the benefits of a flexible infrastructure to the business as a whole. One example of this comes from the dynamic and process-intensive home loan industry, where an Oracle customer originating and funding subprime mortgages wanted to better handle delinquent loans and decrease its inventory of foreclosed properties. To achieve these goals, the customer’s loan-servicing software modules needed to cooperate more smoothly with one another. With 500 employee users both onshore and offshore, as well as up to 1,000 users at partner locations, the customer required a combination of flexibility and scalability in its integration solution.

After choosing Oracle SOA Suite as its standardized middleware platform, the customer began gradually coordinating more and more internal and partner modules as atomic business services made up of IT-centric processes. Because efficiency is paramount in the home loan industry, the decreased processing times and lowered property inventory facilitated by Oracle SOA Suite proved to be

Often, enterprises use successful information systems integration projects as jumping-off points for business integration, thereby extending the benefits of flexible infrastructure to the business as a whole.

significant benefits for the customer. For this reason, the customer plans to adopt Oracle Business Process Management Suite as its BPM layer for a forthcoming loan-origination project while it continues to move upward in the business integration stack.

The Enterprise Service Bus as the Starting Point

Some organizations that have already adopted SOA use their ESB as a starting point for business integration. Typically, such organizations have islands of BPM and business integration that they want to make more accessible and robust. Although these organizations tend to view the ESB as a horizontal infrastructure requirement rather than a strategic business requirement, the reality is that investing in an ESB will return significant business benefits in the form of agility and responsiveness.

This is because the ESB provides companywide accessibility to each island of capability. It also delivers consistent policy enforcement, including security, higher availability, and tighter service levels. With an ESB in place, organizations can easily connect these islands quickly and fill in gaps to achieve business integration, delivering benefits that makes ESBs a solid investment for companies with existing SOA-based capabilities.

With an ESB in place, organizations can easily connect these islands quickly and fill in gaps to achieve business integration, delivering a one-two punch of benefits that makes ESBs a solid investment for companies with existing SOA-based capabilities.

Business Process Management as the Starting Point

For many organizations, especially those that are looking to better execute key business processes, business process modeling serves as an obvious starting point for business integration. To support these efforts and to provide the most flexible and scalable approach, organizations are exploring SOA-based business integration components as a natural next step.

One organization that did just that is Screwfix, a company that sells fasteners and associated tools and had in the past experienced challenges with its replenishment process. In the old days, dealers would often run out of certain products, resulting in lost sales and increased distribution costs—a difficult situation to overcome when all the existing process (as well as any potential improvements to them) resided solely in the heads of business analysts. By adopting Oracle Business Process Management Suite, Screwfix was able to formalize this knowledge and refine a new process. A proof of concept using the rest of the Oracle business integration platform demonstrated that Screwfix could rapidly align its existing data and application assets with the desired process. With a clear business motivation in mind, the benefits of a comprehensive approach were immediately clear.

CONCLUSION

By leveraging existing BPM, integration, and ESB initiatives, organizations can begin to reap the benefits of SOA-based business integration almost immediately. Enabling organizations to achieve substantially better business alignment with only modest extra effort, this type of integration lets organizations grow their business integration portfolio naturally, in response to specific opportunities.

As a result, there are no limits to the benefits of embracing business integration within a company. A natural network effect exists for both the business (composing processes out of atomic business services) and IT (aggregating assets into atomic business services) because new initiatives naturally want to leverage the existing business service portfolio, and adding to that portfolio only increases its value.

Although organizations can approach SOA-based business integration from several directions, a complete platform must include BPM, application and data integration, and ESB components that allow companies to start from any point in the solution space. Oracle is leading the way in this flexible, SOA-based business integration approach through its industry-leading products, practices, and people.



A Revolution in Agility: Business Integration
Through Service-Oriented Architecture
Updated August 2008

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200
oracle.com

Copyright © 2008, Oracle and/or its affiliates. All rights reserved.
This document is provided for information purposes only and the contents hereof are subject to change without notice.
This document is not warranted to be error-free, nor subject to any other warranties or conditions, whether expressed orally or implied in law, including implied warranties and conditions of merchantability or fitness for a particular purpose. We specifically disclaim any liability with respect to this document and no contractual obligations are formed either directly or indirectly by this document. This document may not be reproduced or transmitted in any form or by any means, electronic or mechanical, for any purpose, without our prior written permission.
Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.