



**Realizing business value from an
integrated service-oriented
architecture system in a
multivendor world.**

*Avoid common pitfalls when integrating
across your enterprise*

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Introduction

Most analyst surveys agree that close to half of the companies around the world today are already investing in functional deployments, piloting, or seriously considering a service-oriented architecture (SOA) system. The projections vary widely, with investments expected to reach anywhere from \$18.4 billion by 2012 to as high as \$160 billion. But the message is clear: businesses need to reduce time to market, improve business alignment for growth, and do a better job of unlocking valuable information within an organization. An SOA environment, with its emphasis on reusability and flexibility, is often the optimal answer for many companies.

In fact, as Aberdeen Group noted, those companies planning ahead for deeper SOA adoption are the smart ones. “Organizations that are focusing on SOA infrastructure are outperforming those that are deploying only Web services. They are realizing lower application lifecycle costs, better throughput for projects, and higher levels of user satisfaction.”¹

In this paper, you will learn how to avoid some of the pitfalls you can encounter when extending your SOA infrastructure from limited-scope projects to a broader enterprisewide implementation, and how expert integration can help deliver on the promise of service orientation. We’ll share the real-life experience of clients who have tackled issues that could have sidelined their deployments – and yours.

The new imperative: process integrity

For many companies, the drive to create an SOA environment comes from the need to become more agile and responsive to changing business requirements – whether it’s to meet customer demand, to connect with suppliers or trading partners outside the firewall, or to integrate their own internal systems.

Highlights

Reliability, consistency and predictability in an open SOA environment must equal that of a tightly coupled closed system.

However, an SOA approach brings with it new requirements for the IT infrastructure, which must be capable of handling the processing demands of many application components, versus a single application running in a more traditional siloed environment. The IT infrastructure for an enterprisewide SOA implementation must support a critical concept: process integrity (Figure 1).

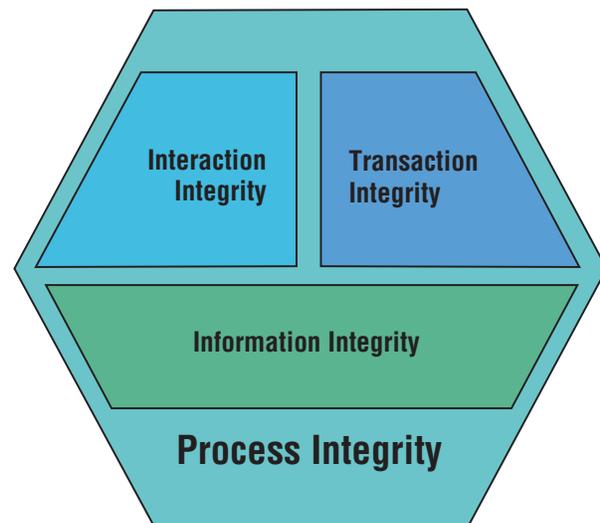


Figure 1. Process integrity is a critical component of SOA implementation.

Process integrity is the ability to synchronize between services, human tasks, information, domains and users in a secure, scalable SOA environment. It's not enough to be agile—a business must be able to deliver the same

Highlights

Process integrity requires end-to-end integration, high quality of service, and security.

reliability, consistency and predictability in an open service-oriented system as in a tightly coupled closed system. That means an infrastructure that supports:

- *Data/information integrity—reliable, complete and manageable information services*
- *Transaction integrity—consistent execution of transactions, and recovery as required*
- *Interaction integrity—users must be provided with up-to-date, secure access to information and content.*

Assembling services (and disassembling applications), as an SOA infrastructure does, brings a serious threat that the new construct will not work consistently well. Process integrity requires end-to-end integration, a high quality of service and security. Get it wrong, and you'll have frustrated customers, lost productivity, costly revenue impacts and increased regulatory risk. Get it right, and you can count on reliable execution of critical business processes in an SOA environment.

Let's take a look at several examples of process integrity in action.

Data integrity in action: revealing hidden dependencies between applications

When a major manufacturer/distributor of automobiles and related equipment wanted to consolidate and share information more easily, it had to consider a global system dispersed across the company's value chain. Burdened with a number of highly customized programs that offered limited flexibility, the company lacked the ability to provide its internal teams the vital client information they relied on for sales, marketing and customer care efforts. And it was not able to deploy new applications quickly. In addition, the company wanted to allow its key reseller network to tap into data in an accessible, yet security-rich, manner.

Highlights

The SOA infrastructure did what no human could easily do before: deliver data quickly in a heterogeneous environment to solve a single query.

The challenge: how to present information on design, procurement, maintenance and custom configuration – which exists in an environment that features a mix of vendor platforms and data formats – so that it looks like it comes from a single source, and still maintains its integrity as it is exposed?

A service-oriented architecture using standard components and open IT standards was able to do what no human in the company could easily do before – deliver information quickly from a variety of sources to solve a single query. The core of the service-oriented infrastructure solution was an enterprise service bus, which provided the connectivity between the various databases. Before the service bus was deployed, employees had to log in and out of each data repository. If, for example, a particular car needed maintenance or repair that required multiple parts, the individual would have to log into the design system for a schematic, then move to the procurement database to order the parts and identify the delivery schedule, then go into the maintenance database to schedule the mechanics to handle the repair.

The SOA infrastructure allowed the company to integrate information without regard for its source, improving interoperability between heterogeneous systems and reducing costs for both development and maintenance of the information access solution. Data integrity depended on the design and implementation of the service bus itself – in particular, the connectivity to existing multivendor platforms and the transformation of various data formats. Assuring that the service bus would scale to support growth and perform reliably were two other key infrastructure-related success factors.

Because of the relative newness of these technologies, companies such as this one often lack the skills and experience to handle complex service bus implementations with confidence. Getting design and implementation assistance from IBM helped this automaker meet both its project timeline targets and its data integrity requirements.

Highlights

With the SOA infrastructure, all transactions are initiated, validated and approved through the Web, saving time and improving broker access.

By engaging outside expertise, the company could reduce risks inherent in a complex project.

Transactional integrity in action: connecting legacy applications with SOA implementations

Faced with a fiercely competitive marketplace, a global financial services company wanted to strengthen ties to its critical insurance broker network, which depends on high-quality products and services, priced right, to meet the demands of an increasingly savvy and empowered customer base. A new corporate Web site aimed at brokers was the first step, but it also needed to be integrated into back-end mainframe systems to deliver true value to the intermediaries.

With a multivendor environment containing both legacy and new applications, the company was challenged to enable an SOA environment that could handle actual transactions – not just requests for information – and maintain process and data integrity as it connected mission-critical applications with customer-facing processes.

By engaging expertise from IBM, the company was able to reduce the risks inherent in the project. A comprehensive SOA infrastructure readiness assessment helped the company understand up front what adjustments and upgrades would be necessary to its existing IT infrastructure to meet the necessary business performance and availability requirements. Through detailed design phases, the company leveraged IBM's SOA best practices, reference architectures and integration expertise that it did not have in-house. The company was able to integrate the front-end Web application, the database servers, and the back-end legacy applications, and maintain end-to-end process integrity. Today, transactions such as customer credit checking can be initiated, validated, then approved as one process, saving brokers considerable time.

Highlights

An SOA environment can help avoid the need to “rip-and-replace” legacy applications and IT infrastructure.

With the right help at strategic points, the SOA infrastructure went live on time and for one-third the cost of a system rewrite.

Transactional integrity in action: moving into the future without replacing the past

For a forward-thinking company, a U.S.-based car rental agency was saddled with an “old-school” IT infrastructure – and knew it. The problem: rewriting critical legacy reservations system or replacing data center applications that supported high-volume reservation transactions, which looked to be cost-prohibitive.

An SOA approach allowed the company to extend the value of existing resources and provide a foundation for future growth. A Web presence was created to allow other online travel services to access the company’s car reservation system, resulting in increased sales. A common messaging bus served as the key mediation agent to connect the disparate assets, allowing the Web services to access the old reservations system without having to “rip-and-replace” or make code modifications to the existing mainframe applications.

But the complexity of the project, connecting IMS and IBM DB2® databases through a Web front end, had the management team hesitant to go live without stress testing the new configuration first. Without in-house SOA testing resources, the company turned to experts from IBM to validate the design. They discovered gaps that could have resulted in incomplete transactions, leaving customers stranded without reservations they thought had been processed. IBM provided the right tools and skilled resources at strategic points, so the team was able to go live on time with the new SOA infrastructure – achieving greater responsiveness for less than one-third the cost of rewriting the existing systems.

Highlights

A portal forms a flexible interface and integration platform between internal business systems and external participants, enabling Web transactions.

Building an SOA environment on an open platform allows for future process changes without impacting the core infrastructure.

Interactive integrity in action: accessing multiple databases through a single Web-based view

A European manufacturing company with an extensive network of subsidiaries and retail sales in 40 countries consolidated multiple enterprise resource planning (ERP) systems, using the opportunity to introduce, in record time, an SOA infrastructure and a Web-based, bilingual service portal. From start to finish, the project took only four months, with a test version ready in just four weeks.

The speed belies the complexity of creating the portal within the SOA environment. The portal forms the interface and integration platform for business processes between internal systems and external participants, reaching out to suppliers, customers and dealers as well as employees. At least 400 dealers and service technicians are connected to the portal, with security features that allow access only to certain pre-determined functionalities based on each user's identity and individual roles. With the portal, information is displayed quickly and flexibly to the outside, while the entire data maintenance and processing remains in the ERP system.

In the first month, the portal processed about 30 percent of items that would previously have been handled manually, saving labor costs and as much as 7 percent on information technology costs. The company is able to achieve higher service quality with support for sales, returns, inventory management, stock-taking, orders and equipment history.

Collaboration was key: one team from IBM prepared the ERP launch while a second IBM team handled the portal development and implementation. With a well-designed SOA infrastructure, the client is positioned for future growth and business changes.

Highlights

A well-architected infrastructure is a leading predictor of success in an SOA deployment.

Many companies will need to look beyond their organizations for expertise in expanding an SOA implementation.

Selecting the right SOA partner

A 2007 study by the IBM Academy of Technology on lessons learned and best practices for SOA projects identified the leading predictor of success in an SOA deployment: a well-architected infrastructure. While a departmental pilot might be successful without completing an overall SOA architecture, once companies began to expand throughout the enterprise, the lack of a planned SOA infrastructure not only affected their ability to implement but often forced them to revisit the pilot and start over.²

Ranked third in the best-practices lineup behind business and IT alignment was having skilled resources to develop and deploy the SOA environment. As many of our examples illustrated, implementing an SOA infrastructure with process integrity requires knowledge and experience. It makes sense that many companies will need to look beyond their organizations for assistance in expanding to more enterprisewide SOA implementations. So, when selecting an SOA partner, look for:

- *Expertise in high-performance, high-availability infrastructures specifically designed and built to enable a production SOA environment*
- *A broad set of best practices, methodologies, tools and proven architectures gained over years of diverse engagement experience in heterogeneous environments*
- *Experienced, well-trained and SOA technology-certified personnel*
- *Access to middleware tools, developers and engineers and other complementary, end-to-end capabilities to speed deployment.*

Highlights

IBM's SOA approach allows existing investments to remain as reusable connections between people, information and business processes.

SOA infrastructure services from IBM Global Technology Services

With more than 6,550 SOA Foundation clients, IBM has developed a robust portfolio of services to help with unique integration and infrastructure requirements an SOA deployment requires (Figure 2). From readiness assessments to strategy and design, through testing and optimization, IBM's infrastructure experts can help:

- *Configure and simplify interfaces between applications*
- *Ensure the infrastructure can be managed and monitored across multiple components*
- *Achieve high service levels across multiple infrastructure servers for process integrity*
- *Develop a security-rich SOA solution*
- *Provide for scalability, performance testing and capacity planning for infrastructure components that are shared across multiple, mission-critical applications.*

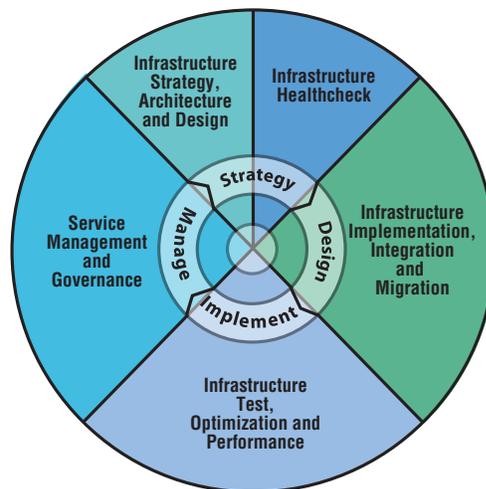


Figure 2. Lifecycle approach to an SOA infrastructure.

In an economic climate that demands cost-effective solutions, IBM's SOA approach protects your existing investments – whether from other IT vendors, or re-purposing custom-written and legacy applications – allowing them to remain as reusable connections between people, information and business processes. And it positions your business for tomorrow's growth and unforeseen business challenges.

For more information

To learn how IBM is helping companies build the IT infrastructure they need to expand SOA deployments, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/services/middleware



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¹ Aberdeen Group. *SOA Middleware Takes the Lead: Picking Up Where Web Services Leaves Off*, July 2007.

² For more information about the 2007 IBM Academy of Technology study, *SOA Foundation Deployment: Lessons Learned and Best Practices*, see another IBM white paper, *Five critical factors for deploying successful service-oriented architecture*, available at http://www.ibm.com/services/us/its/pdf/wp_five-best-practices-for-deploying-successful-soa.pdf