

How ready are you for operational SOA?

Making a successful transition from SOA pilot to full production



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When chief executives talk about the “enterprise of the future,” as more than 1,100 of them did for the IBM 2008 Global CEO Study¹, they paint a picture of a nimble organization, responsive to accelerating change—collaborative, innovative and connected in new ways to employees, customers and suppliers.

For many chief information officers (CIOs), the study confirms they’ve been on the right path for some time now, acting as leaders and change agents within their corporate management teams. Against the backdrop of innovation, they are transforming applications, services and infrastructures into agile environments, moving their enterprises toward a shared vision.

As the pressing need for improved business agility and increased IT infrastructure flexibility has grown, many CIOs have adopted a service-oriented approach to help enable rapid change and drive superior performance. The IBM Academy of Technology has been reviewing hundreds of case studies from thousands of leading global companies to determine the level of maturity and best practices of service-oriented architecture (SOA) projects. And while the experiences vary, the growing body of work suggests CIOs worldwide are encouraged enough to continue moving closer to production-level SOA deployments.²

If your organization is like 96 percent of respondents in another recent IBM survey³, your SOA projects are either “very successful” or “somewhat successful.” However, even if they exceed expectation, you may find nagging questions remain as you consider launching another, more expansive effort:

- *Did we get it right?*
- *Are we ready to grow?*
- *Are we achieving the value we thought we would?*
- *How have we measured value?*
- *Can we support the projected volumes? How quickly can we grow the user base?*
- *Are the right processes in place to effectively support the new environment?*
- *Most important, is everything working as well on the inside as it appears to be on the outside?*

Highlights

As the IBM Academy study found, regardless of where they were on the SOA continuum, CIOs consistently identified critical success factors:

- *Create linkages between IT and business*
- *Architect with a vision toward the future*
- *Address organizational factors early on: culture, skills, training, teaming*
- *Build a scalable infrastructure that can handle the new dynamics of an SOA deployment*
- *Enable governance and service management at the outset to ensure visibility*

This paper will examine the issues CIOs need to address to target these elements for a successful deployment. We will also offer strategies for evaluating the readiness of their organizations to begin executing a broader SOA strategy, providing “self-check” questions for guidance so CIOs can move forward with confidence.

Creating linkages between IT and business

When the Link Group surveyed 300 companies attending an SOA conference sponsored by IBM, 42 percent reported SOA is their company’s top spending priority, even in today’s challenging business environment. Seventy-three percent indicated their “CEO understands the business value of SOA” and more than 50 percent say their IT staff is meeting at least once per month with business managers they support.⁴

Those figures reveal that the value of an SOA is coming through in tangible benefits business leaders are starting to recognize. With that level of support, it’s also clear that the much-sought-after “IT/business alignment” can be realized more quickly, driving even greater satisfaction with SOA deployments. By defining and delivering IT in terms of business services that line-of-business managers understand, CIOs ensure that technology is providing the appropriate response to business concerns. And when the IT benefits are more visible—managing complexity, application reuse and lower integration costs—business starts to feel the effects in increased competitiveness and agility.

By defining and delivering IT in terms business managers can understand, CIOs ensure technology provides the right response to business concerns.

Highlights

Collaboration between business and IT is essential to successfully understanding and standardizing business processes.

Both business processes and applications are at the heart of the SOA. Understanding them sufficiently to standardize and decouple them is no easy feat. It requires intense collaboration between IT and business, and a measure of expertise in business process transformation. Service orientation doesn't start with technology, but thinking in terms of functional components by separating the task from how that task is executed provides an "x-ray" view of business operations. An SOA infrastructure is a key enabler, orchestrating business processes and mediating service providers.

To help align business processes with IT, CIOs should ask:

- *How well are our strategic business priorities being met by our current infrastructure?*
- *Can we identify what triggers a process, what ends it, why it's done, how work is sequenced, how many participants are engaged? In short, do we understand how our business processes translate into transactions with our users and customers?*
- *Are our business processes bound within individual lines of business, or do they span the business horizontally?*
- *Does the IT department understand the business benefits of the SOA it will be supporting?*
- *How quickly can we deploy a service in support of a new process?*
- *How easy is it for the business to steer a new course in light of agility needs, and is IT able to keep up and support the needed changes?*

These "meeting-of-the-mind" conversations between IT and business, while often challenging and highly charged, can only improve the company's ability to innovate on an enterprise-wide level.

Highlights

An SOA allows for increased agility and improved communication across silos—but deployments can pose significant technical challenges.

An SOA reference architecture provides a framework for getting started and a reference point for measuring progress.

Architecting for a service-oriented environment

Once you've identified processes and services components, the next step is to create an architecture that collectively supports business goals. As a flexible and extensible framework, an SOA allows for increased agility, better use of existing business capabilities, and improved consolidation across siloed applications and organizations. However, there are significant technical challenges associated with an SOA deployment. Whether or not you establish a senior SOA architect role, as many best-practice companies are doing these days, or a core architectural committee, an architect needs to be able to answer questions such as:

- *Do we have an architectural framework to help us guide different transformational projects?*
- *Are we reusing architectural experiences from within our company or from external experts?*
- *Is our current tooling for development and deployment supporting SOA benefits we'd like to achieve?*
- *Do we pay enough attention to the information side of SOA besides the process considerations?*
- *Do we have a comprehensive view of both data and infrastructure security in this environment?*
- *Are we able to identify all necessary architectural decisions and alternatives, and make the right decisions with our skill set? Do we need more education or external help?*

If you're not careful, answers to those questions can send you and the team off in different directions. Using an SOA reference architecture can provide an expedient starting point and help avoid fruitless diversions.

Highlights

“Don’t reinvent the wheel. There are lots of valuable and reusable methodologies, techniques and reference architectures available. Sometimes you just have to find new ways to apply, combine, adapt or expand them,” one Academy study participant noted.

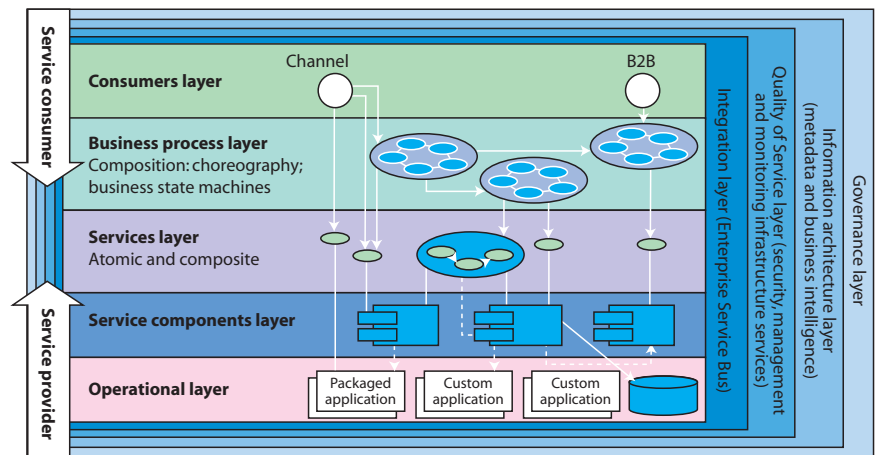


Figure 1. This high-level abstraction of an SOA reference architecture defines layers, architectural building blocks within the layers, options available at each layer and typical architectural decisions that need to be made.

Using a reference architecture is a best practice that can help keep SOA projects on track.

A reference architecture (Figure 1) can also help you keep track of the progress you are making in transforming the enterprise architecture from a traditional point-to-point system to a more modularized, service-oriented state that puts business and IT on the same path. It also ensures that while the functional (horizontal) layers are addressed, the other critical issues, like security and governance, are also considered.

Highlights

Human capital issues play a big role in the success of an SOA, including the level of adaptability to change, availability of skills, training and culture.

Enabling the cultural shift necessary for success

Business leaders recognize that their people drive the business processes within an organization. They know that the work environment determines the level of effectiveness. And so, a growing number of businesses are looking to SOA as a key step toward enabling their people to rapidly access and interact with targeted business processes and information. Interestingly, those who will benefit may be the most resistant to the changes brought about by the project.

For many companies, workforce adaptability has been elusive. The IBM Global Human Capital Study 2008 found that only 14 percent of respondents believe their workforces are very capable of adapting to change.⁵ What do the leading-edge adapters do that others don't? In the context of SOA deployment, the CIO should give these "human capital" issues as much weight as the technology decisions, and be able to evaluate the readiness of the organization to make significant cultural changes.

CIOs should ask their human capital management counterparts:

- *Do we have the required skills and future availability over the next three to five years?*
- *Can we readily identify and locate individuals with specific expertise?*
- *What can we do to foster an environment that allows people to collaborate across organizational boundaries?*

As business processes and their supporting technologies become modules for reuse in the SOA environment, the ways in which users interact with and "own" them change as well. Changes may mean a loss of control or familiar solutions, so it takes time for users to realize that, to get the benefits everyone is after, you have to share more.

Highlights

Users need time to adjust to changes an SOA brings; smart leaders stay committed and focused on the ultimate business rewards.

Tools are available to help diagnose service performance and utilization issues that can affect the SOA deployment.

As the Academy study noted, “Proactively boarding the staffing model with training and support from experienced mentors in each of the core disciplines is paramount. SOA can be daunting to organizations that attempt to move forward using current development, architecture and management practices. Not only must IT staff be trained, but business staff that works with IT must also be trained appropriately in the SOA lifecycle.”

A cultural shift like that required for an SOA can take time and will seldom be accomplished in one smooth transition. Leaders need a measure of resolve and commitment to get through the rough spots, and stay focused on the ultimate rewards for the business of an SOA approach.

Assessing infrastructure flexibility

People and processes are key elements of an SOA, but of course, you’ll want to take a hard look at the physical infrastructure, too. Flexibility is the single most important attribute your IT environment can have to ensure success with an SOA deployment. Sophisticated research tools are available to diagnose problems and provide insight into service performance across selected elements in the infrastructure. They can analyze server and cluster performance and utilization to help your team identify SOA performance issues that can rapidly undermine business confidence in the architecture, as well as predicted return on investment.

For example, your IT team should be looking at how the SOA transactions are impacted by dynamic services. As you expand, you’ll know rather quickly whether the infrastructure is meeting demand spikes. Transactions may be delayed or lost, and infrastructure operations can become overwhelmed. Even if the pilot was stable, you may find your IT team is spending more time on configuration management and changes as the user count increases.

Health check drives savings

A major Asian government had deployed an SOA solution for managing tax collections from local banks within its local province, but was still relying on manual systems in other provinces—much to the dismay of its increasingly technologically savvy population. Government representatives decided it was time for a change.

After completing an SOA health check assessment, the government discovered it could simply extend its current SOA solution to the outlying provinces, using open standards for easier integration with the hundreds of different banking systems. Today, the government manages millions of transactions daily, and the CIO estimates savings of nearly US\$1 billion by expanding the small-scope SOA rather than building a new, less flexible system.

Another key indicator of flexibility is the level of virtualization taking place. A healthy SOA environment is able to proactively manage, control and optimize workloads virtually, allowing you to move beyond physical constraints across shared resources. Virtualization involves multiple areas of the environment, including servers, storage, networks and applications.

Quality of service and responsiveness will suffer if your infrastructure has not been properly architected for high availability. You'll be unable to meet important service-level agreements, and may run into transaction or process integrity issues.

Questions your IT team should ask, and be able to answer:

- *Can the project be supported within the current infrastructure?*
- *Do we understand the new requirements the business is imposing on us?*
- *What is the business criticality behind these requirements? How fast do we need to adapt?*
- *How can we provide the necessary capacity planning to ensure coverage when we need it, without too much unused capacity when we don't?*
- *How does business flexibility translate in IT requirements, in development and delivery?*

Managing and delivering services

If there's an area of agreement among CIOs creating an SOA environment, it's that governance and service management are essential elements. As one CIO informed IBM, "Although SOA governance can, and generally should be, implemented in the context of an SOA project, it should be introduced prior to the first major SOA project—i.e., during initial SOA pilots. This positions the organization to successfully handle the complexity of a major project rather than treating it as a training mission."

Highlights

Service management helps preserve resiliency, manage performance, address change and help maintain critical service level agreements.

With business transactions and user satisfaction both at stake, delivering on service level agreements becomes a critical success factor.

SOA governance is an extension of corporate and IT governance, focused on managing the lifecycle of services that provide business value. Because so much is new in an SOA—technologies like the enterprise service bus (ESB) and service registry, new roles and responsibilities, new approaches—the development and runtime environments require special attention to design, enable, monitor and manage them successfully. Good governance is all about transparency at all levels: people, process and technology. It properly empowers people, ensures the benefits of reuse, and provides operational visibility.

Service management for an SOA helps preserve resiliency in a dynamic system, manage performance and predict and manage change. Capacity and performance management can prove more challenging in an SOA than in the traditional application-based production environment, with the loose coupling between the services provided and the resources that perform those services. Composite applications add layers that can increase processing overhead, bandwidth requirements and transaction response times. Messaging sizes are often larger, and security requirements become a major consideration in an SOA environment.

An SOA approach requires a concerted effort to define service level agreements (SLAs) both by functional requirements and non-functional requirements like availability, continuity, capacity and security. These will help determine the technical platform to be used, but more important, the level of support for the business processes that are now, through the SOA, linked to the IT components in new ways.

A production-level SOA requires new management skills and tools. A service management assessment can help ensure services are being monitored end to end to isolate and fix issues, especially since a new layer of abstraction can make problem identification and resolution more difficult. And if you lack visibility into SOA services and their interaction with shared resources, your IT staff will be challenged to deliver on SLAs. Because an SOA leverages horizontal processes that span organizational boundaries (and skill sets), it's even more essential to implement automated process managers to keep tabs on availability and performance management, and allow consistent release of new services.

Highlights

IT management can provide valuable information about the relationships between applications, processes and infrastructure that may be impacted by the SOA.

CIOs should ask IT staff:

- *Do we understand not only the infrastructure-to-infrastructure relationships, but also the application-to-infrastructure relationship?*
- *Can the infrastructure effectively handle changes imposed by the SOA, or do we constantly operate in reactive mode?*
- *Are we on top of the new tool, skill and information requirements introduced by these changes?*
- *Does our performance and capacity management take into account the “decoupling” of IT resources from the services they support?*
- *Have we paid enough attention to configuration management? Can we track relationships between technical elements as well as services and their relationship to the business processes?*

How IBM can help

CIOs are uniquely positioned to help their enterprises proactively prepare for the future by delivering the IT innovation they need to not just navigate but embrace wide-ranging change. With a broad scope of software and services for SOA, including SOA application and infrastructure health checks, IBM can help CIOs take the next step toward becoming flexible, scalable, service-oriented organizations. For those CIOs just beginning to explore the value of an SOA, IBM can assist with both IT infrastructure and business consulting and architecture services. Leveraging the experience IBM has helped many companies realize value much more quickly.

For more information

To learn more about how IBM can help you transform your organization’s strategic vision into operational reality by using a service-oriented architecture to enable a flexible, dynamic IT infrastructure, please contact your IBM marketing representative or visit the following Web site:

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¹ IBM Global CEO Study: *The Enterprise of the Future*, May 2008

² "Five best practices for deploying a successful service-oriented architecture," http://www-935.ibm.com/services/us/its/pdf/wp_five-best-practices-for-deploying-successful-soa.PDF

^{3,4} IBM survey, conducted by the Link Group, at IBM IMPACT 2008 event, <http://www-03.ibm.com/press/us/en/pressrelease/24436.wss>

⁵ "Unlocking the DNA of the Adaptable Workforce," IBM Global Human Capital Study 2008, IBM Global Business Services



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