

Companies of all sizes know that their IT systems are constantly under pressure to respond quickly to tactical change, while at the same time having to adopt new operating models that enable rapid strategic change. Service-orientation principles can offer companies mechanisms to effectively respond to fierce business demands by helping with the alignment of business and IT decisions. IT organizations that adopt service-orientation principles using a service oriented architecture (SOA) approach can reach the flexibility, reuse and adaptability that will make them better prepared to compete and win in the marketplace, while also gaining the potential to lower costs (from reuse) and increase revenue (from adaptability and flexibility).

What is SOA?

SOA is an architectural approach that structures IT assets as a series of reusable, loosely coupled services that perform business functions using a standard specification. These reusable services often reflect business tasks, such as opening a checking account, verifying a credit-card transaction or processing a purchase order. By structuring applications in this manner, IT assets become more flexible, enabling companies to better align IT assets in dynamic business environments because they can snap together services as building blocks to create new business processes. Combining existing applications with new, service-oriented applications creates composite applications. And reusing existing investments helps an organization increase return on investment (ROI).

SOA is a standards-based approach to enterprise architecture that uses IT systems to help:

- Enable business agility.
- Promote innovation.
- Optimize business efficiencies.
- Reuse core capabilities to create more business value.

Why SOA?

Globalization, new markets, new work forces and new competitors are making business agility a critical factor for success. Companies should use SOA technology to support business issues, because:

- Software applications have grown so that they cannot be easily adapted to address constant existing and emerging business demands. New business models driven by collaboration, partnerships, and mergers and acquisitions, as well as internal integration needs, mean that IT systems have to work together.
- Ripping and replacing the IT environment is not an option, because a good portion of the business logic and processing resources are already available — and need to be reused.
- The industry standards used in SOA are stable and adopted across technology vendors.

SOA creates agility, paving the way for enterprises to integrate their business processes end to end across the company and with key partners, suppliers and customers, responding with speed to any customer demand, market opportunity or external threat.

What SOA is not

- One isolated product
- Only one software or hardware technology
- A rigidly defined architectural structure
- An isolated effort
- A project that has to be implemented all at once
- An approach that delivers value without planning and control
- Just a passing phase, but the accumulation of tried and tested experience from across the industry to help engineer IT systems to deliver sustainable business value
- A universal cure to solve all IT issues

Recognizing an SOA project

Keywords to help identify the fit for service orientation include:

- Business process management
- Multichannel integration
- Improving customer service

- Automating processes across multiple companies and users
- Reusing business logic
- Expanding businesses to partners
- Business integration
- Application modernization

Characteristics of maturing SOA projects include the ability to:

- Make IT systems be more flexible to integrate people, processes and information.
- Integrate applications across lines of business (LOBs) or domains of control.
- Treat existing or new software assets as reusable services.
- Foster the maximum possible reuse, including best practices, to create consumable services.
- Enable companies to consider the cultural impact related to reuse, collaboration and LOB buy-in.
- Use Web services standards to clearly identify interfaces, communication and collaboration among services.
- Use portal technologies to enable the assembly and orchestration of composite applications.
- Recognize the impact of loosely coupled connections on computing and network resources.
- Model the way that business operates.
- Provide a service registry or repository.
- Manage business processes.
- Exploit technology architectures to provide the foundational elements required to build a robust SOA.

Companies can realize more value from SOA as they develop projects that enable them to implement an SOA approach across the business, and they better understand the implications of controlling it.

Caution!

Characteristics that can affect SOA results include:

- Reusing components without focusing on creating services
- Imposing rigid interaction between systems
- Defining components but not necessarily services
- Mandating the use of specific products to be SOA
- Focusing little or not at all on extracting reusable best practices

When might a company be ready for SOA?

Companies face a variety of business issues — a subset of these issues is listed in the following table. Follow the links to learn more about how SOA can help deliver real business results.

Business issues	SOA can help to:
<ul style="list-style-type: none"> • Agents can't see policy coverage information remotely. • Calls and faxes are used to get information from other divisions. • Clinical patient information is stored on paper, on-site. • Gaining access to supplier design drawings is a complex process. 	<p>Integrate data to distribute to employees or improve access to information. Learn more about this capability at ibm.com/software/info/connect/en/index.jsp?S_CMP=wssite.</p>
<ul style="list-style-type: none"> • Cost to handle customer calls is high. • Reconciling off-invoice deductions and rebates is difficult. • Staff spend hours on hold to determine patient insurance eligibility. • High turnover leads to excessive hiring and training costs. 	<p>Understand how business tasks interact to better manage administrative costs. Learn more about this capability at ibm.com/e-business/on-demand/us/innovation/cbm/cbm_b.shtml.</p>
<ul style="list-style-type: none"> • Customer loyalty is decreasing due to incorrect invoices. • Customers are placed on hold while staff check order status. • Companies are unable to quickly update policy endorsements. • Service levels are poor. 	<p>Improve customer retention to deliver new products and services while reusing current IT investments. Learn more about this capability at ibm.com/software/swnews/swnews.nsf/n/rdoy6kur6e.</p>
<ul style="list-style-type: none"> • Time is wasted reconciling separate databases. • Processes such as trade allocations are handled manually. • Companies are unable to detect quality flaws early in the cycle. • Amount of time spent scrapping and reworking projects is too high. 	<p>Improve customer loyalty with better business integration. Learn more about this capability at ibm.com/software/webapp/iwm/web/pre-Login.do?source=sw-app&S_PKG=eiiinfokit&S_TACT=__S_TACT__&S_CMP=__S_CMP__.</p>

Check ibm.com/soa to learn more, including information about case studies and an SOA assessment.

SOA: A technology perspective

SOA is an evolving IT approach that enables companies to build new, innovative business value while taking advantage of the experience and maturity of many technologies, including:

- Web services
- Transactional technologies
- Information-driven principles
- Loose-coupling components
- Object-oriented design and development
- Event-delivery models
- Java™ 2 Platform, Enterprise Edition (J2EE) technology
- Microsoft® .NET technology
- Service Component Architecture (SCA) (see key definitions)

It also offers new ways of looking at how technology helps businesses become more agile and nimble. Many technologies can coexist in an SOA project, connected through standards, well-defined interfaces and organizational commitments to focus on reusing services instead of building a new solution from the ground up. None of these technologies themselves deliver SOA in isolation. Most of them collaborate in SCAs.

What you need to know about SOA.



An SOA checklist starter

Not everything in IT can be categorized as SOA. The following table includes some of the elements that can be part of SOA projects, but that alone would not deliver the full value of service orientation.

SOA	Not necessarily SOA
Uses portal technology to build composite applications.	Uses a portal generically as a front end for applications.
Clearly defines interfaces between services—regardless of where services reside or how they are implemented.	Includes object-oriented code components portable Java code and pure use of standards with no services defined or no cooperation between services.
Manages the relationship between the business-logic components—ultimately managing business processes.	Is managed at the infrastructure level—network computing-resource levels or even applications—without connection to the business.
Focuses on business-driven development to create reusable assets.	Includes services that have been created ad hoc with no up-front consideration given to reuse.
Provides information as a service.	Provides data-management features traditionally built on databases.
Has a services registry and repository.	Doesn't have software components available for wide reuse.
Includes a messaging backbone to assure delivery of any type of data from anywhere to anywhere with transactional context.	Delivers point-to-point, in-house-developed communication channels between applications.

Overcoming SOA objections

Consider how SOA can help environments where service orientation might not be immediately considered.

Before SOA	After SOA
Application systems are self-contained.	Applications can be exposed and used by other internal parties.
Business processes are mostly internal and tightly coupled.	Business processes can be reused across organizations—both internally and externally.
The IT environment is homogeneous.	More choices for the IT environment can lead to a lower total cost of ownership (TCO).
Companies require and want real-time performance.	Appliances and optimized hardware can improve performance; technologies are advancing rapidly to meet real-time constraints.
Business processes and business-interaction protocols aren't automated or integrated.	Formally specified processes can help companies become more flexible in creating business offerings.
Peer relationships between IT and business units can be difficult to forge.	SOA provides common ground for business and IT.

The bottom line on SOA

- SOA helps companies be more agile by enabling the alignment of business needs and IT capabilities.
- Business drives IT requirements, and SOA allows the IT environment to effectively and efficiently respond to these requirements.
- SOA is about helping companies apply reusability and flexibility that can turn into lower cost (of development, integration, maintenance) and can help companies to increase revenue.
- SOA helps businesses obtain sustainable competitive advantage through technology.
- Choose IBM for SOA because of IBM's understanding of service orientation and the industry.

IBM is uniquely positioned to help companies embrace SOA. With the diverse strength of offers across hardware, software and services, SOA from IBM supports the simplest adoption and scaling all the way to enterprise-wide transformation.

Some key definitions

- **Application service.** A repeatable business task represented by a software module deployed on network-accessible platforms offered by the service provider. Its interface is defined by a service description. It exists to be invoked by or to interact with a service requestor. It can also function as a requestor.
- **Business services.** Goods or services that a business component offers to other business components and to external parties.
- **Service oriented architecture (SOA).** An architectural approach that structures IT assets as a series of reusable services that perform business functions. By structuring applications in this manner, IT assets become more agile and organizations are better able to align their investments in dynamic business environments.
- **Composite application.** A set of related and integrated service-oriented processes that wire together services and other processes to provide flexible functionality to the business.
- **Application component.** A modular unit of functionality, accessed through one or more interfaces. A component can be composed of other components, but a component is not necessarily a service.
- **Business component.** A part of an enterprise that has the potential to operate independently, in the extreme case as part of another company.
- **Service Component Architecture (SCA).** A set of specifications that describe a model for building applications and systems using an SOA. SCA extends and complements prior approaches to implementing services, and builds on open standards such as Web services.

- **Business process management (BPM).** A discipline that covers the full range of application-to-application, interapplication, workflow and person-to-person process management, including process design, automation, management and continuous improvement.
- **Service registry.** A searchable registry of service descriptions where service providers can publish their service descriptions. Service requestors can find services and obtain binding information (in the service descriptions) for services during development for static binding and during implementation for dynamic binding.

For more information

To learn more about SOA, visit the following Web sites:

- SOA: ibm.com/soa
- SOA and Web services: ibm.com/software/solutions/webservices/
- WebSphere Global Community: www.websphere.org
- IBM SOA solutions: ibm.com/jct09002c/isv/soa/index.html
- IBM SOA Foundation skills road map: www.software.ibm.com/ibmdl/pub/software/dw/wes/wtte/soa_foundation_2-21.pdf
- SOA and IBM business integration: ibm.com/software/info/openenvironment/soa/index.shtml
- SOA programming model: ibm.com/developerworks/webservices/library/ws-soa-progmodel/
- Service Component Architecture: ibm.com/developerworks/library/specification/ws-sca/
- SOA and the IBM Systems Agenda: www.elink.ibm.com/public/applications/publications/cgibin/pbi.cgi?CTY=US&FNC=SRX&PBL=G224-7585-01