



PIECING TOGETHER SOA

Sure, it sounds scary and technical. But **SERVICE-ORIENTED ARCHITECTURE** is the next big shift in software development and it will affect your mid-size business sooner than you think.

WRITTEN BY LAUREN GIBBONS PAUL
ILLUSTRATED BY MIRKO ILIC



WITH EVERYTHING THAT'S required to keep your business afloat, the last thing you want to hear about is another technical acronym—especially one that speaks to all kinds of complex issues and the jargon surrounding software programming. Better to get up to speed on such a new technology, conventional wisdom has it, when you can buy it packaged up neatly in a box at your local office supplies store.

That's a dangerous attitude to take when it comes to Service-Oriented Architecture (SOA). Major change is afoot in the world of software development, and SOA represents the next major step in the evolution. Small- to mid-sized businesses (SMBs) can't afford to bury their heads until the dust around SOA settles. Certainly, SOA and its implications are pretty technical and abstract. Even CIOs at Fortune 500 companies are struggling to understand the implications and choices. So if you're intimidated, you're not alone.

The move toward SOA is affecting both companies that develop their own applications for use in-house and companies that create software to sell commercially. In the simplest terms, SOA enables companies to create new functions (called "services") to be used both inside and outside the

four walls of the enterprise much more quickly and easily. Services are flexible and easily changed, rather than monolithic applications that are cast in stone once written.

Granted, since most SMBs do not do any software programming of their own, SOA is not immediately applicable. But, that will change over time, as companies grow and begin to have a hodge-podge of their own software applications.

"When you're small enough and you have one software package that does everything for you, integration doesn't matter and neither does SOA. But the moment you need to do some integration, that's where SOA starts to come into play," says Dan Foody,

CTO at Actional Corp., an SOA software vendor in Mountain View, CA. "As your business grows, your systems will need to grow with you. [SMBs] need to be prepared to deal with SOA." If you invest now in SOA-ready applications, you won't face the monumental task of having to rip out everything and replace it a few years down the line.

Large companies have always created applications that draw on data from different systems. To do that, they had to do a lot of behind-the-scenes knitting, or integration, to tie together the data to form an application. The resulting custom-programmed links among systems are sometimes called "spaghetti code," hinting at their messiness.

SCOTT SMATHERS

CROSSING OVER: CIBER's Hoerster is helping SMBs navigate SOA waters.





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Data integration (sometimes called “enterprise application integration,” or EAI) is extremely expensive and time-consuming. By some estimates, large enterprises spend nearly half of their IT dollars on integration.

Another problem is that with traditional software, every time something changes in the business process, each instance of affected code has to be changed by hand.

What is different here—and potentially earth-shattering—is under an SOA, snippets of software code make up services (for example, “authenticate user,” “check credit,” or “create new e-mail account”) rather than monolithic applications. These services can be easily joined together and broken apart, reusing them again and again, with much less fuss and muss. This approach to software development speeds the creation of new functions and makes the whole software landscape much more flexible.

Setting the Stage for SOA

The single most important concept in SOA is the notion of reusable software services as opposed to a single application focused on one function.

“The whole idea is to have these logical units of service, whatever they are. They can be simple or they can be a complete business process, but to have them independent and not chained to each other,” says David Hoerster, solutions architect for CIBER

Inc., a systems integrator in Pittsburgh, helping many SMBs dip their toes in the SOA waters.

For instance, one of CIBER’s clients, a mid-sized company in the financial-services industry, needed to interface with a much larger business partner. “They received data feeds from many different places and they needed to integrate those into one system. They used to write a separate application for each data feed,” says Hoerster. But if either of the parties ever changed their business processes (setting different credit policies, for example), all of the data interfaces would have to be rewritten. “We changed the way that customer thought of integrating with trading partners. We moved away from individual applications and used SOA to move to a centralized way of dealing with all trading partners.”

One good way to get your head around SOA is to focus on a potentially less-intimidating, but related concept: Web services. Web services involve enabling the exchange of data according to standard Internet protocols. If you’re like most SMB professionals, you have at least a nodding familiarity with the idea.

SOA goes only one step further, describing the

WHO’S PLAYING THE SOA GAME?

trickling down the software food chain. Here’s what the big guys are doing with SOA:

■ **Microsoft Corp.** is a major SOA player. Its .NET software development framework is often used as a platform for companies to build open, standards-based applications that can be easily exchanged via Web services. In addition, Microsoft BizTalk Server is an integration platform that can serve as a backbone for an SOA.

■ As one of the biggest suppliers of software and services to large enterprises, **IBM** is now scrambling via its SOA Partner Initiative to get its network of systems integrators and consultants up to speed on SOA so they can start bringing the word to companies with fewer than 1,000 employees.

■ **SAP**, the granddaddy of enterprise software, has re-architected its whole product line around SOA. It is unlikely that SAP’s flagship NetWeaver will ever be used by small businesses, but like IBM, SAP is working with partners to bring the SOA vision and technology to mid-market customers.

Led by the industry heavyweights, SOA is fast

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overall architecture, or schema, on which chunks of software are created for maximum reusability and collaboration. “SMBs focus on the things that make the business go round. The last thing on their mind is to put themselves on the leading edge of technology adoption. But they do want to be competitive and maximize the investments they have already made,” says Shaun Jones, director of SMB marketing for IBM’s software group in Somers, NY. That’s why it’s important to start thinking about SOA now.

When attempting to understand the services concept, it’s helpful to see a few examples of things that would not be services as defined under an SOA. Some functions are too narrowly defined to be useable as services. For example, “get customer address/phone number.” Unto itself, that limited function is not useful enough to be worth the effort to “expose” it as a service (i.e., make it accessible to others). “You’re just retrieving one piece of data. It’s not going to give you enough bang for the buck,” says Brent Carlson, co-founder and CTO of LogicLibrary Inc., a Pittsburgh-based SOA software vendor.

At the other extreme, there are business processes that are too complex to become automated services. For example, a chief financial officer might love to have a software service that would close the

accounting books for the year. But there is too much human judgment involved. “The process is too complex to automate fully,” says Carlson.

Discrete elements of the accounting process such as “retrieve monthly sales numbers” would make useful software services to be used by internal employees and perhaps even shared outside the organization.

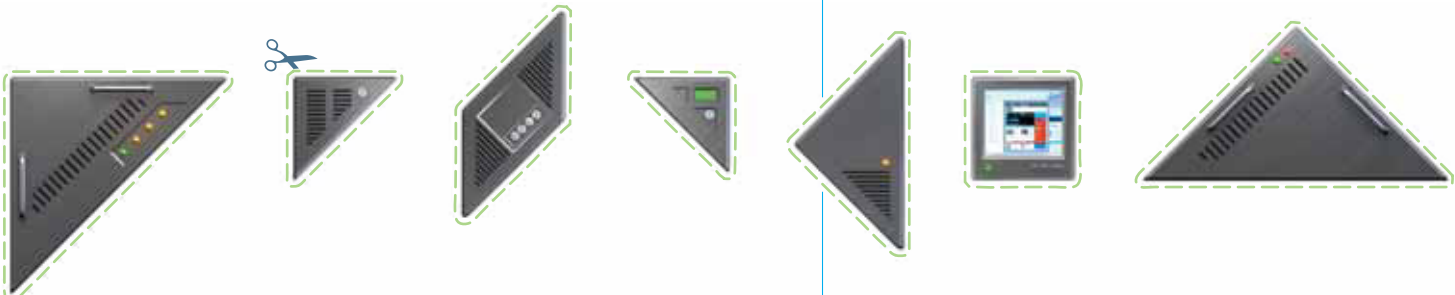
Playing with the Big Boys

Going forward, SOA will be relevant for SMBs for two reasons. First (assuming they are running the business on more than one application), they can use an SOA to create services and make them available to business partners and customers, which lets them operate like and compete with much larger businesses. For example, a small wholesaler might create a service for online bill presentation that would allow its customers to pay electronically, a feature that most large companies would offer.

Second, SMBs can create services that will allow them to gain efficiencies through greater automation. A small retailer could build a service for its supplier/vendors to manage their own inventory (just as Wal-Mart requires its suppliers to do).

SOA will also have major consequences for SMBs on the software delivery side. The new architecture will allow the large enterprise software vendors like SAP, IBM, and Microsoft to deliver their monolithic software applications in more easily digestible chunks, making this functionality more affordable and putting it more easily within reach for smaller companies. Also, as more and more firms of all sizes establish SOAs, collaboration and data sharing will become easier and easier, enabling small firms to team up to serve large customers.

MAKE YOUR OWN TANGRAM!



Of course, this isn't going to happen overnight. Clearly, SOAs are still not in widespread use. Currently, only the largest, savviest users of IT have established this type of software development architecture and are creating and deploying re-useable services.

But what can you do now to start preparing for SOA? Start by keeping SOA in mind the next time you consider an important software purchase, quizzing the vendor to make sure they support Web services/SOA. This may not always be readily apparent. "There are two classes of software out there. One is software that is built around Web services. The other is where Web services are just a sideline and one way to connect into the system," says Foody. You may have to probe a bit or talk to some customers.

The bottom line: As the software architecture of the future, SOA can help you adapt more rapidly to business change. "[SMBs] should be thinking about the services they can publish to improve their business processes and be more cost effective," says Marty Shuchman, vice president of software and services for Apptix Inc., a provider of hosted applications to SMBs in Herndon, VA. Questions Shuchman suggests SMBs consider include how do they communicate today with their partners and what can they do with them to be a little more friendly for collaboration? It also helps to think about what external systems can be integrated into their company.

"Small companies are very nimble. They are going to get bigger and their audience will be larger. How they interact with partners and customers will be so, so important," says Samir Gulati, vice president of marketing for Apptix. "It's all about improving the way you do business at the highest level. If you can expose your services, you can talk more seamlessly with your partners and customers."

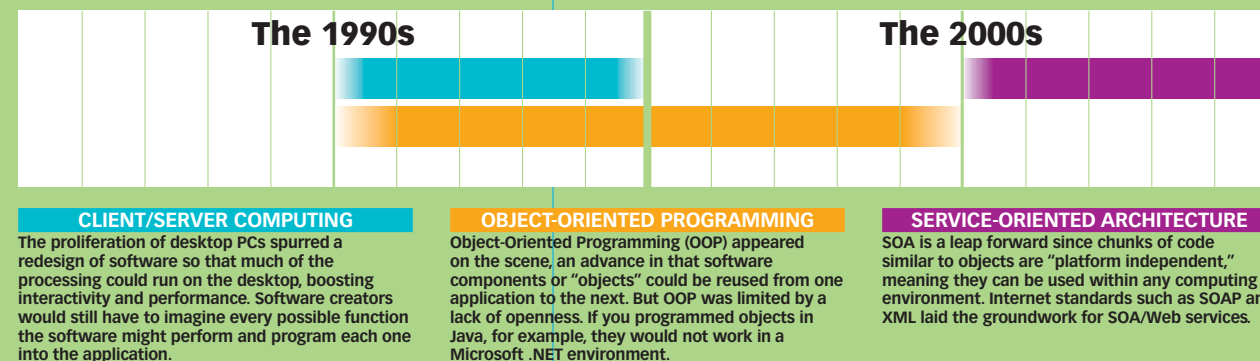
Lauren Gibbons Paul has more than 15 years of experience as a writer for such publications as *eWEEK*, *CIO*, *Managing Automation*, and *Network World*.

SOA PUZZLE

SOA will eventually usher in big changes in software. Here's what you need to know.

ILLUSTRATIONS BY JIM KOPP

EVOLVING TO SOA The new era of Web services has been years in the making. The next-generation is a leap forward in bringing flexibility and platform-independence to software development.



SOA SPEAK SOA ushers in its own alphabet soup. Here are some basic translations:

Service-Oriented Architecture (SOA): An architecture built around a collection of reusable components with well-defined interfaces. Though often based on Web services, SOA is an abstract framework and runs independent of any specific technologies.

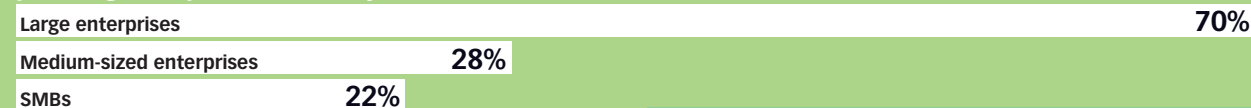
Enterprise Service Bus (ESB): A software infrastructure that uses a standard interface and messaging to integrate applications; one way to implement an SOA.

Loosely Coupled: The use of well-defined interfaces to connect services. SOAs are built using a loosely coupled approach, where a change in one service does not require changes in linked services.

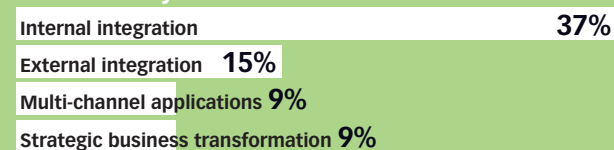
Middleware: Middleware provides a mechanism for connecting various applications, even across platforms. Data resides in message queues where receiving programs can retrieve it without creating a direct connection with the sending applications.

THE YEAR OF SOA Forrester Research Inc. recently surveyed 116 North American corporate decision-makers on their SOA adoption plans. Here are some highlights:

Who is using SOA today or planning to implement it this year?



What do they use SOA for?



SOURCE: Forrester Research Inc.

SOA AT WORK Some real-world examples of how SOA will be used:

1 A small manufacturer of custom tables needs to communicate with its suppliers and customers. This company could leverage information from its manufacturing system to create services such as "look up order" or "check ship date" to give its partners and customers access to this information. Once created, these services would be reusable.

2 A mid-size healthcare provider needs to interact with governmental agencies, medical supply vendors, and patients. The provider could create services such as "create medical record" and "bill Medicare" for both internal and external use.

3 A mid-size retailer has to check the creditworthiness of its customers before allowing them to sign up for an in-house credit card. Rather than creating a stand-alone software application to perform a credit check on each applicant, the retailer could break up that function into several individual services (such as "verify address," "confirm existing credit card," and "check bank balance") under an SOA.

Yea: "An SMB should care about SOA because of what it can enable them to do and how it can affect their business. Where can they offer applications that make them act more like a large business?"

—David Crisafi
Director of Technical Empowerment,
Progress Software Corp.



POINT/COUNTERPOINT



Nay: "SOA is not on the priority list for most small businesses. Most do not develop their own software, they buy it off-the-shelf."

—Merle Sandler
Senior Research Analyst,
International Data Corp.

FOR MORE INFORMATION Want to know more about SOA? Try tapping these resources:

WEBSERVICES.XML.COM
What is Service-Oriented Architecture?
<http://webservices.xml.com/pub/a/ws/2003/09/30/soa.html>

CBDI FORUM
SOA Fundamentals
www.cbdiforum.com/secure/interact/2005-07/soa_fundamentals.php

WEBSERVICES.ORG
Contains a collection of SOA-related articles and explainers. (Requires free membership.)
www.webservices.org