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The role of Service Level Agreements in Successful SOA Deployments

*Getting the most from SOA means gathering the right metrics
for SOA SLAs*

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About the Author

Carol Weiszmann is a partner at aimpublications.com, a content consultancy at the intersection of technology and business. She analyzes and writes about how key information technologies impact enterprise productivity and profitability.

The role of Service Level Agreements in Successful SOA Deployments

***The State of Real-World SOA* — makes it clear: In many organizations, SOA is beginning to play a mission-critical role. But making sure SOA applications live up to expectations takes more than hope and hype. It takes the right kind of SLA based on the right kinds of application performance metrics.**

by Carol Weiszmann

All organizations seek agility, which is why so many organizations today are attracted to service-oriented architecture.

Trade in tightly-coupled traditional application design techniques for modular, loosely-coupled alternatives and you get reusable components/services and standards-based protocols that speed software development, improve system interoperability, revive legacy investments, and make quick(er) work of adapting to changing business conditions with competitive processes, products, and services.

Typically hosted on an application server (J2EE) or a Web server (Microsoft .NET), SOA applications are, in effect, orchestrations of multiple components/services that can be located virtually anywhere and implemented in a variety of ways.

The reusability of already proven SOA components/services means they can be configured and reconfigured with a certain degree of confidence into different combinations for different purposes in different applications.

Because SOA components/services are generally standards-based, using them simplifies communication between disparate systems that have traditionally operated in independent silos and have relied on complex tightly-coupled code for point-to-point inter-silo communication. This sort of simplification addresses one of the daunting problems of enterprise IT: using information technology to improve business processes.

But SOA introduces complexities of its own. Every SOA component/service and each of their intersects presents a possible point of application failure. As the number of SOA applications grows, the volume of components and services they incorporate balloons, along with all those intersects — and the likelihood of application failure and unhappy customers escalates fast.

The downside of the loose-coupling nature of SOA and its extra flexibility is that the actual running system doesn't always behave the way it was originally designed, especially as time passes.

SOA: Enterprisewide Right Now

Results from *InformationWeek's* recent *The State of Real-World SOA* survey, conducted in July and August by *InformationWeek*, indicate that SOA has been widely embraced and is quickly on its way to playing a key role in mission-critical production applications.

The survey received 615 responses from executives in the United States, the United Kingdom, France, Germany, and Australia whose organizations are either deploying SOA applications or planning to. These organizations use SOA applications for a broad range of functions, both employee-facing and customer-facing, as Figure 1: Where SOA Apps Are Being Deployed indicates.

The organizations surveyed in *The State of Real-World SOA* have deployed and continue to deploy multiple SOA applications — and multiple types of SOA applications. While 28 percent of

respondents have pilot-stage SOA apps, in many cases, these deployments are not one-off pilots or even limited to a single business unit. They are enterprisewide and they mix customer-facing and employee-facing applications.

Twenty-nine percent of respondent organizations are deploying SOA applications as part of an enterprisewide strategic initiative, and almost 70 percent of those report deploying customer account inquiry/customer service SOA apps. More than 50 percent of them say they're deploying eCommerce catalog shopping/storefront SOA apps enterprisewide.

Similarly, several employee-facing SOA apps other than CRM — financials (accounts receivable and payable), HR, and help desk functions — are being implemented enterprisewide by at least half of the survey respondents.

Clearly SOA is being put to work on key enterprise functions, so it's not surprising that fully 78 percent of respondents to *The State of Real-World SOA* survey report plans to run mission-critical SOA applications in a production environment.

These plans are more prevalent in larger organizations, and overwhelming in organizations with revenues between \$100 million and \$1 billion, where almost 48 percent of the organizations surveyed come out of just four industry sectors — financial services/banking, government, healthcare/medical, and insurance/HMOs (see Figure 2: SOA Apps — Becoming Mission Critical Fast).

As might be expected of organizations deeply committed to SOA, those responding to *The State of Real-World SOA* survey have put some key SOA-supporting technologies in place (see Figure 3: Technology Tools That Matter).

Topping the list is portals, the presentation framework widely regarded as an integral element in an SOA environment; indeed, Gartner has recommended portals as a first step in building an SOA environment. ESBs — which act as an intermediary providing authentication, transformation, and routing services that can

be configured and deployed at runtime — are another SOA building block, especially in strategic enterprisewide deployments.

'We've lost all visibility'
But it's the takeup of application performance monitoring and management that reveals the most about the current state of real-world SOA and the lessons that implementers are learning.

"If you don't adopt an APM strategy and solution, your development costs may go down, but to keep the systems running and to service them over time, your downstream costs in production IT go up," says Jeff Cobb, Senior Vice President of Product Strategy and Distinguished Engineer at CA Wily.

FIGURE 1: WHERE SOA APPS ARE BEING DEPLOYED

Percent of Respondents

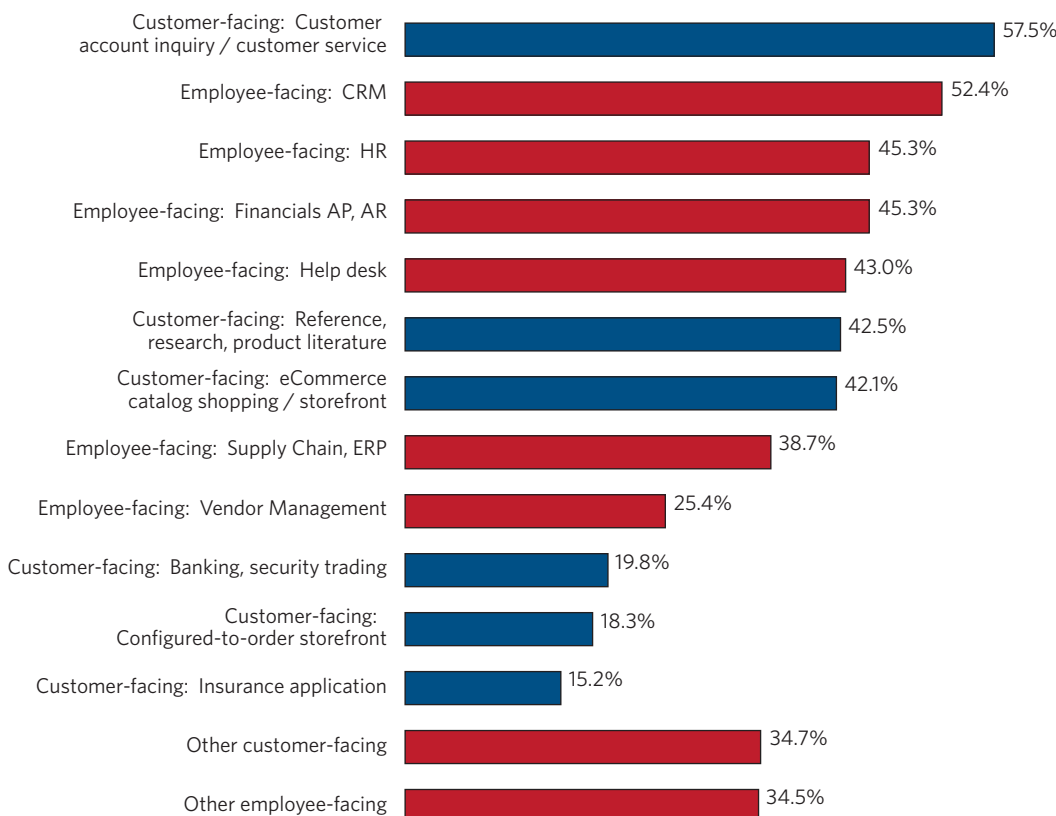
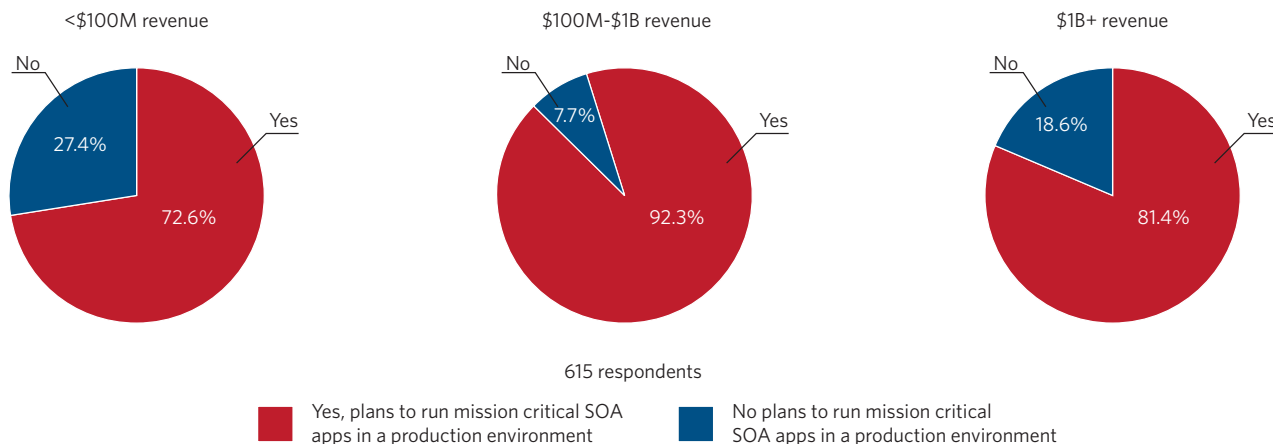


FIGURE 2: SOA APPS — BECOMING MISSION-CRITICAL FAST

Plans to run mission-critical SOA Applications in a production environment



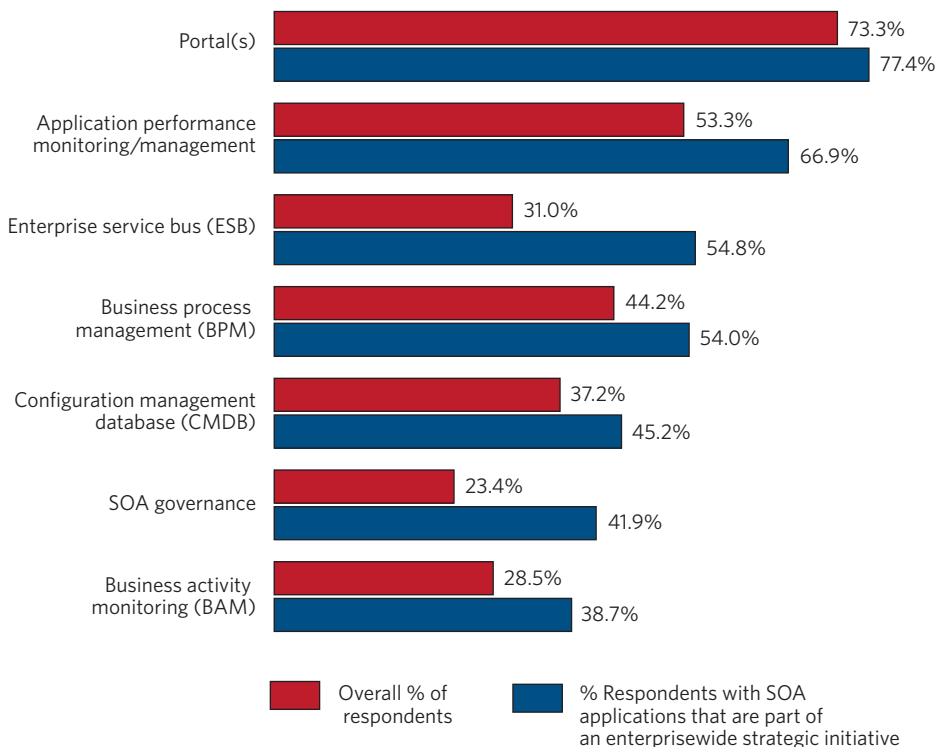
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“This can make an organization extremely unproductive. In addition, you may end up losing many of SOA’s desired flexibility benefits.”

Managing the quality of SOA application performance depends on IT operations staff having visibility into the entire SOA transaction path, end-to-end, including all integration points, services/components, applications, and connected back-end systems.

Cobb hears all the time about what organizations don’t have. “People tell me, ‘We implemented a SOA. Now we’re all loosely coupled, traffic is flying everywhere — and we have no idea what’s going on. We’ve lost all visibility into where the bottlenecks are and into how to tune the system. When something goes wrong, we can’t isolate it’.”

FIGURE 3: TECHNOLOGY TOOLS THAT MATTER



Unintended Consequences

Such lack of visibility means IT operations staff cannot gauge customers’ experiences with SOA applications.

Worse, they won’t know about an application failure before receiving a call from a dissatisfied customer. Nor can they set proactive alerts that signal out-of-bounds performance conditions before customer service-level agreements are compromised. Both of these abilities are cited as very important by most respondents to *The State of Real-World SOA* survey.

And both abilities require the right tools to monitor and measure customer experience to determine how well SOA applications are performing and to be able to intervene on application behavior

when performance doesn't meet agreed-to levels. Or, better yet, before SLAs are violated and customers notice falloff in application performance.

Unless IT knows the composition of a SOA application, the location of its services/components, and the specific ways its transactions flow, IT cannot guarantee SOA app performance levels or troubleshoot problems.

What Makes SOA SLAs Different

SLAs establish levels of overall service delivery according to the needs of the business.

In traditional deployments, SLAs are more straightforward and easy to implement using conventional tools. Metrics can be gathered and code can be added to applications to process these metrics.

What's different with SOA SLAs is the complexity of the technical requirements with which an SOA application must comply. SOA's loose coupling raises a whole new set of SLA issues.

Matching SOA technical requirements to performance levels. New kinds of SOA technical requirements/capabilities must be matched to SLA performance levels. SOA app SLAs must incorporate

these different technical requirements, which are based on new kinds of information about how the application is behaving. This includes visibility into

- Performance, availability, and customer experience 24/7,
- SOA app transaction paths,
- Changes to application features, composition, location, communications,
- Services/components used in SOA apps and linkages to other services, applications, and tools, and

Thus enforcement of SOA application SLAs depends on monitoring tools that can provide such metrics as processing time, queries per day, messages per hour, reject-ed transaction counts.

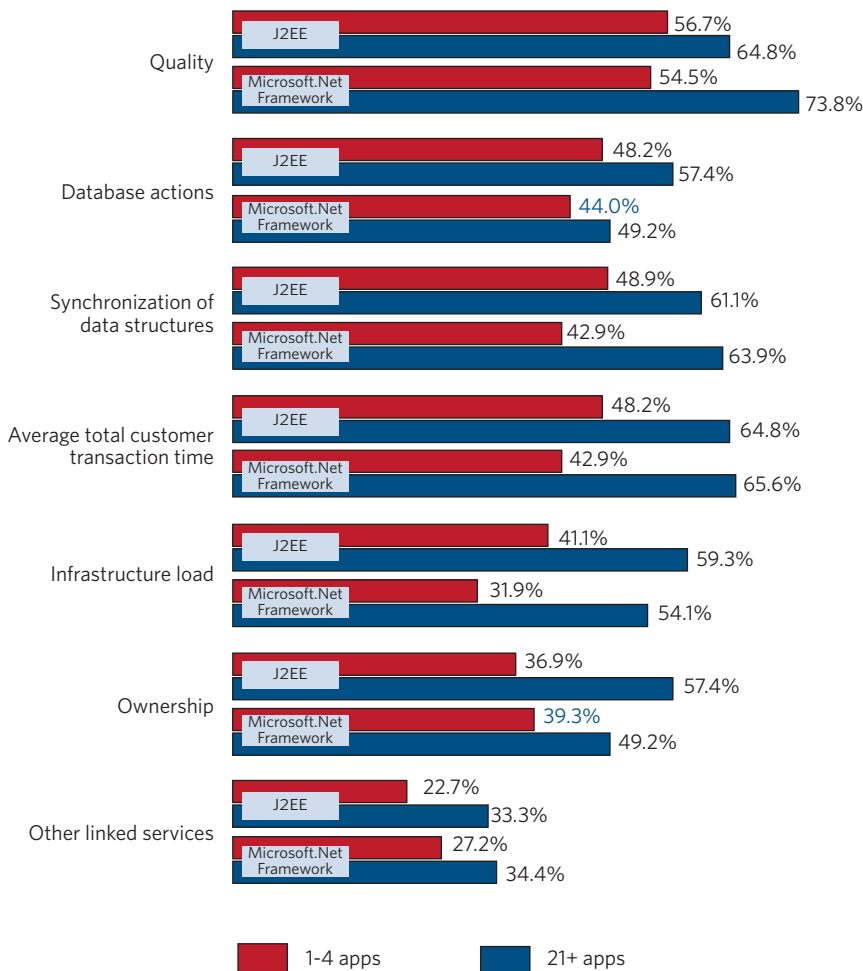
Capturing the entire customer experience. Still, application performance guarantees may not be met even when each component is achieving its performance benchmarks. This can be especially problematic when the overall app is expected by its customers to be highly available. Hence it's important to monitor performance of SOA components without adding overhead to the monitored environment.

SOA SLAs must define service-level metrics so as to capture the entire customer experience with applications and their environment.

This means tracking a wide range of service-related performance metrics in real time on a per-message basis — including number of concurrent users, throughput, latency, availability — to reflect the end-to-end flow of SOA transactions.

FIGURE 4: A LOOK AT SOA SLAs

What elements are included in your SOA service-level agreements?



In addition, SOA SLAs must be defined in terms of service operations, message content, identities, etc. — and may get redefined as new (reusable) services are incorporated. This means that new kinds of SOA SLAs may be required between enterprises.

From these SLA metrics and other service data, flexible performance policies can be created to help identify and handle SLA violations/exceptions.

Key SOA elements

The *State of Real-World SOA* survey shows that organizations doing the most with SOA — as reflected in their deployment of larger numbers of SOA apps — are more likely to include elements in their SOA SLAs related to quality, average total customer transaction time, synchronization of data structures, and infrastructure load (See Figure 4: A Look at SOA SLAs).

Yet it's worth noting that at most only about a third of those deploying more than 21 SOA apps have included requirements about other linked services — suggesting that use of other linked services is still limited. This, in turn,

suggests that the real complexity of SOA — in which SOA apps are crosslinking with other services from a variety of sources — remains nascent.

Because SOA applications are so often about business processes, the SLAs that steer their performance levels provide organizations' business process owners a new kind of opportunity to participate proactively in ensuring the applications that customers see and use are really meeting customer needs (See Figure 5: How Proactive Are Business Process Owners?).

The *State of SOA* survey shows that this opportunity is best understood by those with

the most SOA experience — that is, those implementing large numbers of SOA apps on the .NET platform, where many are developing new applications as this platform continues to mature.

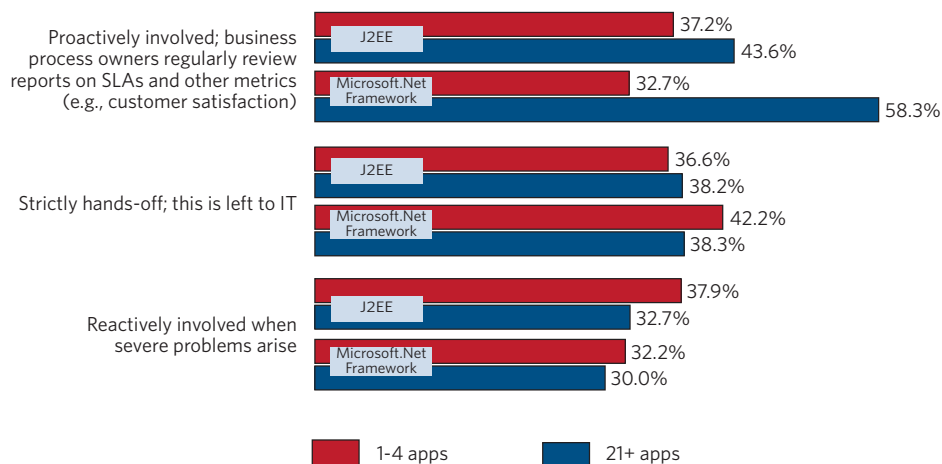
What's Needed Now

Discovering performance issues, determining the precise type and location of a problem as it occurs, and resolving problems fast regardless of their source and before customers notice performance fall-off, before SLAs are violated — to do all this takes a new kind of application performance management tool designed for SOA environments.

Such a tool must be capable of

- Monitoring the end-to-end response-times of SOA application transactions,
- Maintaining a deep understanding of SOA application performance beyond the limits of the application itself to determine why an SOA app isn't performing and how that performance lapse affects shared components, services, etc.,
- Mapping dependencies and facilitating visibility into individual SOA application transactions as well as the app's associated components, services, and connections,
- Ensuring SLA compliance via real-time 24x7 visibility into SOA app performance, including proactive warning of a slowdown or outage, and
- Reporting historically on individual application, services, components, connection behaviors and errors for capacity planning and to spot problem patterns.

FIGURE 5: A LOOK AT SOA SLAs
What elements are included in your SOA service-level agreements?



the most SOA experience — that is, those implementing large numbers of SOA apps on the .NET platform, where many are developing new applications as this platform continues to mature.

If SOA service-level agreements are to be effective, IT operations staff needs the right kind of monitoring and measuring tools to cope with the new kinds of complexities posed by SOA's loose coupling. SLA metrics can no longer be limited to a single application or component or service residing on an siloed server. ♦

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