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HOW TO AVOID THE HIDDEN PITFALLS ON THE ROAD TO SOA

The case for a comprehensive data services framework

It is widely agreed in concept that service-oriented architecture (SOA) can break down barriers between applications to enable the reuse of services across application silos within an enterprise. Hence, SOA holds great promise as the enabler for a new generation of more agile and cost-effective IT solutions. Unfortunately, it has failed so far to live up to these high expectations. That's because, in their zeal to realize the benefits promised by early SOA hype, customers and technology providers have overlooked a crucial component for the success of any SOA initiative. That is, they've ignored the data.

Data is an extremely important enterprise asset that goes through a series of complex transformations through its lifecycle, as it gets created, processed and consumed by different parts of the business for various operational and analytic purposes. While traditional approaches to SOA, based on a simple web services paradigm, address high-level application integration and business process orchestration needs, they tend to minimize, or worse yet ignore, the complexities of heterogeneous, inconsistent, dirty data that lies fragmented throughout the enterprise.

Debra Parker's experience may be indicative of the great promise—and pitfalls—of enterprise-grade SOAs.

As the eGovernment Development Manager for the City of Minneapolis, she has implemented ten SOA projects, two of them enterprise-wide. The deployment has mapped well to the city's expectations so far, enabling the reuse of services and reducing application development time. But the implementation of SOA has shined a light on—and perhaps even created—an issue that threatens the success of any SOA project.

"People realize how bad their data is and how difficult it is to get relevant reporting out of it," says Parker. "When things become cross-functional, like in an SOA, this problem only gets magnified."

SOA offers a way to decompose enterprise applications into reusable and sharable "services," bringing agility to business processes by eliminating the walls between applications. But in breaking down these silos, SOA forces the data contained within to be exchanged seamlessly between disparate applications and business processes. This free-flowing exchange requires a high degree of data accuracy and consistency, but SOA technology providers have largely ignored this need for a holistic approach to data management and integration. This was one of the main issues that came to light during an extensive survey and in-depth interviews with Parker and other IT executives on SOA implementations, conducted by IDG Research Services. Among the key findings, a majority of the interviewees noted that SOA creates interdependencies between systems demanding high-quality and consistent data, suggesting that the full benefit of SOA cannot be realized if projects don't incorporate an enterprise information management strategy to address the widespread—and expensive—problem of data inconsistency and inaccuracy. Without a service-oriented data-centric architecture that is built on a sophisticated data integration engine, SOA can result in bad data being propagated to more applications and users, much faster than ever before.

"SOA does not permit you to abdicate responsibility for data integration issues—it increases the criticality of addressing them," noted Gartner analyst Ted Friedman in his report, "Data Integration for Strategic BI and Beyond" (Gartner, Inc., Gartner Business Intelligence Summit, March 12 – 14, 2007).

Customers who have undertaken the path to SOA have recognized that SOA presents a number

of data-centric challenges, such as:

- Heterogeneous data sources distributed across the enterprise and beyond
- Inconsistent and constantly changing data structures
- Poor data quality that is often difficult to measure or monitor
- Lack of agreement or visibility (single-view) into critical information assets

Noel Gayle, vice president of technology at I.A. Morrison, knows that all too well. "The key is catching how changes [made to one application] impact other systems," he says. Morrison's approach is to develop rules within middleware to manage the data, but Gayle says that "every once in a while, data changes another aspect of the application you haven't built rules for, and it has a negative impact on the application."

SOA: The End Justifies the Means

These sobering discoveries aside, SOA adoption is accelerating. According to IDG Research Services, 91 percent of CIOs are planning, evaluating or piloting SOA projects. That certainly reflects strong optimism about the ultimate benefits of SOA, even if it means investing months or years in development and testing to get there.

"The sky has been painted very blue and we have huge expectations," says the vice president of technical services at a multi-billion dollar financial institution. His company is rebuilding its entire customer-facing Web infrastructure with SOA, and expects to leverage the same SOA infrastructure for money transfers, mortgages and authentication applications. "The list is just endless. The sky is truly the limit with SOA."

The payoff for SOA will be great if implemented carefully and correctly, with the appropriate up-front emphasis given to both the data and business process aspects of the business.

In making the business case to support SOA projects, 73 percent of CIOs said improved productivity was the primary driver, while 64 percent hope SOA will improve IT response time to business requests. Other drivers, according to CIOs, include improved customer service levels and better accuracy and visibility into customer information.

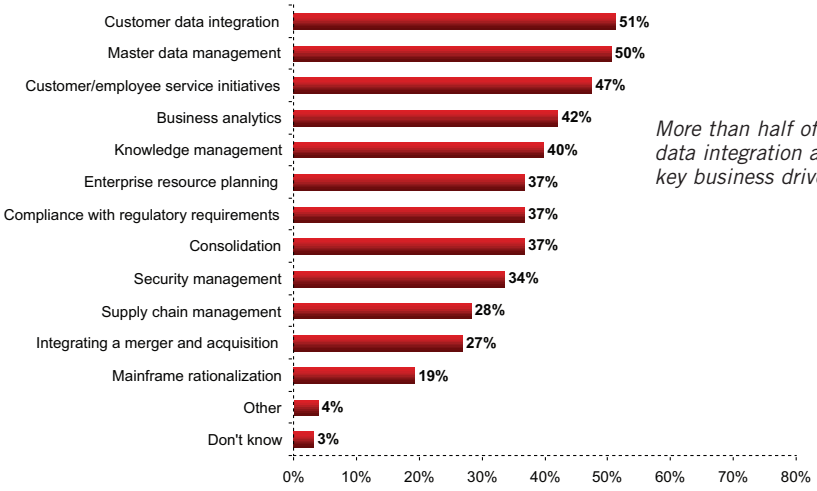
The last point hits home with the insurance company vice president. He says his company is losing business to a larger rival because the latter wows customers with presentations that include entire customer histories and portfolios, while his company is pitching for business using spreadsheets with incomplete customer visibility information.

It's not uncommon for businesses to lose sales because of poor visibility into their customer data. Having a single view of the customer is critical to businesses seeking to increase overall revenue through improved customer satisfaction and greater up-sell opportunities.

CIOs are starting to get the message. More than half of CIOs surveyed say that customer data integration and master data management are key business drivers for their SOA projects (see chart below).

Furthermore, according to the survey, "data" seems to be the common factor among the key drivers for a successful SOA project:

- Business flexibility and reusability of software assets and services built on a foundation of



More than half of CIOs surveyed say that customer data integration and master data management are key business drivers for their SOA projects.

quality data
- Project scope driven by the extent to which data and applications touch the entire business
- SOA "readiness" involving more upfront work, namely testing and data quality assurance, than anticipated

SOA represents a fundamental change in the way businesses are run, a move from rigid, tightly-coupled systems to loosely-coupled systems where applications are built practically in real-time. Knowing the location, format, structure, usage and context of data is therefore crucial. Simply put, when it comes to SOA, data management and integration have never been more important.

Data is the Key

As we have seen in the previous sections, far from making data issues irrelevant, SOA poses an actual risk to companies that lack a data integration strategy.

As many applications touch data through multiple levels of services, the impact of a change to even a single data component may be huge. Indeed, the vice president of infrastructure at a multi-billion dollar insurance company warned of "cascading failure" as a result of application inter-connectedness made possible with SOA.

Data integration will account for a growing percentage of the overall integration market, particularly as SOA projects take hold. As businesses strive to reduce latency and become more "on demand," data ownership and integration becomes increasingly important. This trend will be further reinforced as businesses adopt industry standards like SWIFT in the financial services industry, ACORD in insurance and HL7 in healthcare, to exchange information with partners in their value chain.

According to IDG Research Services (see chart below), of the CIOs surveyed, approximately 75 percent consider data integration to be high to critical for a move to SOA.

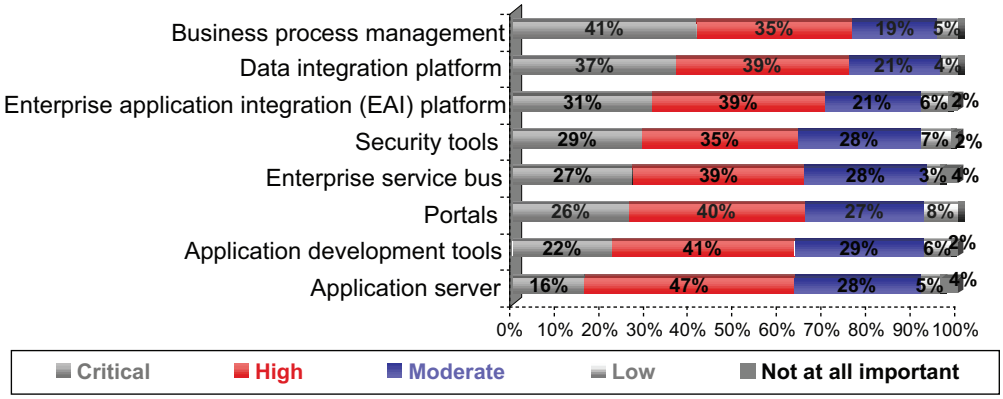
As we can see from the research findings, data integration will have a major impact on the way SOA projects are implemented.

The Case for a Data Services Platform

A study by the Data Warehousing Institute found that poor-quality data costs U.S. businesses hundreds of billions of dollars a year. If the data stuck inside siloed applications is bad, imagine the calamity when, through SOA, the silos disappear and data from many different applications is commingled. Bottom line, interconnected applications aren't worth anything if the data within them is flawed.

To realize the full potential of SOA, including loose-coupling and reusability, it's critical that the application and business process layers are able to access business-relevant data wherever it resides, in whatever form it is required, and in a consistent and accurate manner.

What is needed is a comprehensive data services platform built on a sophisticated data integration engine that will enable data integration within an SOA framework. A data service is a modular, reusable, well-defined, business-relevant service that enables the access, integration and right-time delivery of enterprise data throughout the enterprise and across corpo-



75 percent of CIOs surveyed consider data integration to be high to critical for a move to SOA.

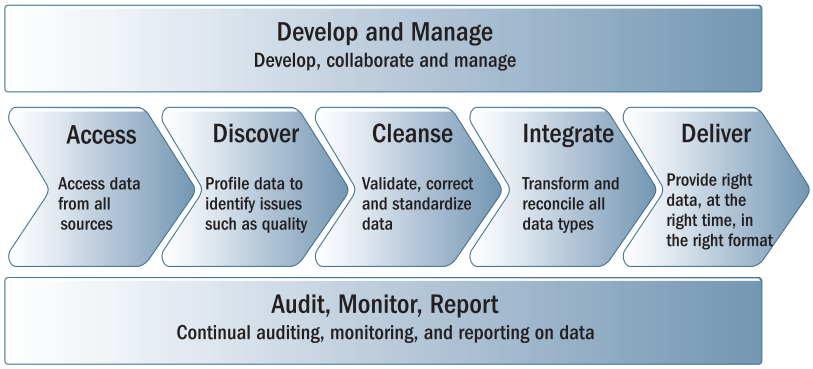
rate firewalls. Data services platforms reconcile the structure and semantics of data so that, when accessed by any user anywhere on the system, the data has already gone through a series of steps such as profiling, validation, cleansing and transformation, making it ready for consumption.

One simple example: a data services platform enables companies to build services to define, map, update and reconcile, say, a customer across all business processes. Once that has been defined it is mapped to all representations of that customer in the different enterprise applications within that IT environment. If there is a new record of the customer made in a Siebel application, it is updated and reconciled in other applications like SAP.

Unlike business services, data services are specialized services that are more granular, enable loose-coupling with data sources, are data-centric and enable sophisticated and proactive data integration.

Data services, with hooks into master data, are flexible and modular, so that data is defined, reconciled, corrected and delivered in a holistic way. In fact, the connection between metadata management and data integration cannot be understated. It's the foundation. Having complete metadata ensures more effective use and reuse of data assets.

Metadata provides reference information about data, including where it "lives" on the system, its syntax, format, and quality. Having a strong handle on metadata management is crucial to the success of any SOA initiative because it helps map data correctly.



Data integration lifecycle for a comprehensive data services platform

An efficient data services platform must address the following functionality:

- Infrastructure services for providing basic functionality around authentication, access control, logging, etc.
- Access or CRUD (Create, Read, Update, Delete) services for creating, reading and updating data from backend systems
- Integration services for providing sophisticated data integration functionality like transformation, matching, cleansing, enrichment, federation, etc.
- Metadata services for managing and using the technical and business metadata for audit, lineage, and impact analysis purposes

Finally, a comprehensive data services platform must interoperate with existing investments in other middleware technologies like EAI and BPM to form a complete architecture for addressing the complete gamut of integration tasks in an SOA.

Conclusion

The case for SOA has already been made and has been increasingly accepted as a way to drive business agility, improve process management and ultimately help companies to be more competitive. There is definitely tremendous excitement about the promise of SOA, because it will have a direct impact on a company's performance in the marketplace. However, SOA projects are doomed to fail if they do not incorporate an enterprise information management strategy to address complex and expensive data problems.

In conclusion, a comprehensive data services platform built on a unified, open and platform-neutral architecture that will enable access, discovery, cleansing, integration and delivery of data, therefore, must be a part of any SOA initiative. Only then can customers begin to realize the true benefits of SOA for delivering true business and IT alignment and agility. ■