

BINARY WHITE PAPER

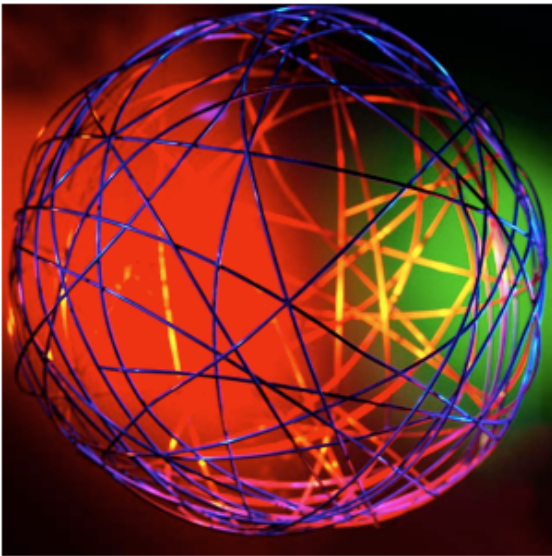
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Service Oriented Architecture

Implementation Guidance and Management



from strategy to impact

SOA Implementation Guidance and Management Office

Introduction

The purpose of this white paper is to discuss the value of establishing a Service Oriented Architecture (SOA) Implementation Guidance and Management Office (SIGMO) to support SOA implementation planning at the Enterprise level. Large organizations that are transforming their enterprise information technology (IT) systems architecture from program-centric, monolithic systems to service oriented architecture need an organizational component that can champion the “how” aspect of SOA implementation in order for the organization to move forward. This paper is organized into three sections. The first section provides the foundation for adopting SOA across the enterprise. The second section describes the roles and relationships in developing a SOA and the importance of a SOA management strategy in facilitating development. Finally, the third section examines the positive impact that a SIGMO can have on progress towards transformation and the products that can be developed to facilitate implementation.

Why Adopt SOA?

SOA represents a new way of doing business that is enabled by enterprise IT capabilities. It is a paradigm shift in an organization’s enterprise IT strategy from constructing elaborate systems to the adoption of agile utilization of re-



sources. Large monolithic systems represent the former and SOA services represent the latter. This is not to disparage the development of large, complex systems since there are many elegant and useful examples. For example, the space shuttle, a modern jet fighter, or even a city’s subway system are all large and complex. However, all such intricate systems are by their very nature difficult to change from their original design functionality since they were built to address a large set of fixed requirements.

Monolithic software designed for complex business processes take years to evolve from basic requirements to fully fielded systems. Even if these systems are built on flexible and modular component technology, they can still be difficult to change because of the retraining and distribution challenges. These elaborate systems are at best like the subway system, useful as long as they are applied to the job they were design for, and at worst, similar to a Rube Goldberg® drawing – brittle and prone to failure.

Furthermore, the business processes they support are trapped in the internal system architecture. It often takes enormous effort and time to make the simplest changes even when only training and redistribution are involved.

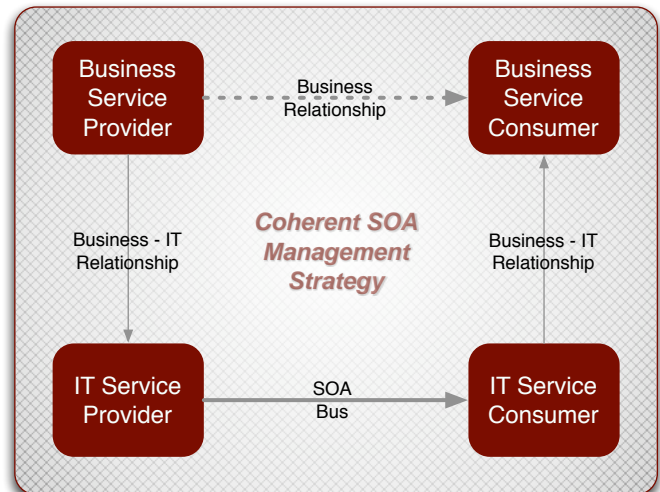
Service Oriented Architectures represent an alternative to the stovepipes that are created under the monolithic application approach. In a SOA, services provide single points of reusable business logic that are recomposed dynamically to meet changing business processes. Additionally, SOA services include metadata that provide dynamic discovery to aid in searching for solutions when faced with new business challenges. Rapid location and composition of services is a regular part of this agile approach to solving business challenges. Dynamic resource utilization represents SOA at its best and can be used to solve time-sensitive problems whose solutions exist outside of the boundaries of the initial design of the original services.

The desired outcome is to promote sensible and readily understood services and ensure that critical metadata is captured in a searchable metadata registry. Teams that have expertise in both the functional business domain as well as experience defining and deploying SOA are the best teams to create sensible and readily understood services.

Shared Services Management Strategy

The diagram to the right illustrates the multiple relationships needed to roll out services in a true service oriented enterprise. There are four clear relationships visible on the diagram and are described counterclockwise from the upper left.

1. The first relationship is the business relationship between business service provider and business service consumer. This relationship is why the service exists in the first place.
2. The business service provider has a relationship with the IT service provider to translate business objectives into technology (service interface, mappings, metadata, etc.).
3. The IT service provider provides the service to the IT service consumer using adopted SOA technology standards. This relationship is often the only one that is specified as metadata.
4. The business service consumer has a relationship with the IT service consumer who brings the service to the business consumer's workspace (via service discovery and access).



Tying all of this together is a coherent SOA management strategy which provides the fabric needed to support service discovery, automated pairing of services, and rapid service composition by business users. There are four more relationships that exist between each of the four roles and the SIGMO (who represent the policy and governance guidance for the SOA).

With so many relationships involved, it is no wonder there is so much confusion surrounding SOA. The SIGMO must be able to speak fluently across all of these relationships. This includes:

- being fluent in business/domain concepts and terms,
- being fluent in translating from business-speak to tech-speak,
- being fluent in translating from tech-speak back into business-speak, and
- being fluent in SOA technology (tech-speak).

The SOA management strategy must clearly spell out the parameters for negotiating business interfaces, translate from business to technology and back, and define technology standards and protocols needed to ensure interoperability. This is accomplished through metadata kept in a metadata repository. Finally, the management strategy must specify the core responsibilities needed of each of the roles in order for them to be first class citizens of the service oriented enterprise.

Why Organize A SIGMO?

An enterprise should organize a SOA Implementation Guidance and Management Office (SIGMO) to support its transformation goals because the Office can plan and initiate a series of activities that progressively enable SOA to be implemented enterprise-wide. The SIGMO will assign experienced SOA specialists to functional business units, or Communities of Interest (COIs). Implementation of a service is driven by the COI that needs the service. The SIGMO SOA team helps move the development of the new service forward by explaining the SOA management strategy and governing its application. The use of collaboration technology to catalyze a network is highly recommended.

At the start, each community begins redefining its IT in terms of composable data and services with the help of a SOA specialist assigned to the community. It is important to initially train the COI members in SOA management strategy to avoid backsliding into the traditional monolithic stove-piped approach. The SOA specialists will also assist integration into the larger service oriented enterprise (SOE) through the use, wherever possible, of standard vocabularies defined in the metadata repository. When standard terms are not possible, the SOA specialist will employ mappings to and from the service to the enterprise vocabulary and possibly employ business rules within the definitions of the mappings. The integration is completed when all of the interface specifications, mappings, and business rules are registered in the enterprise service metadata registry. The SIGMO team can also ensure alignment of the services with the SOA management strategy which ensures that larger enterprise architecture, policy and governance are satisfied. This is particularly important in Department of Defense (DoD) systems.



SIGMO Team Composition

The ideal SIGMO team is composed of SOA specialists who have at least ten years of experience in enterprise IT and experience in developing and deploying enterprise services. Additional skills and experience should include a large subset of the following skills matrix:

- Architectural design of services
- Definition of service metadata using tools
- Change management
- Integration and deployment of services into an enterprise network
- Commercial SOA technologies and techniques
- Software and Systems Architecture
- Automated tools to support integration and analysis
- Related current and emerging SOA standards (Web Services, XML, Web 2.0, HTTP, etc.)
- Agile project management
- Multi-tenant service development
- Delivery of services under strict policies and governance
- Ontologies, Semantic Web, Tagging
- Security and security architecture



In the DoD, it is important to also have the following skills and experience:

- DoD Enterprise Architecture (EA)
- DoD/DNI governance and technical direction
- Specific Service Enterprise Service Strategy
- Specific Service Portfolio Management (PfM) efforts

The SIGMO should leverage the same COI service infrastructure and enterprise services to coordinate and synchronize across engagements. The SIGMO does not need to be a large group at its inception and can be immediately effective with only a half dozen SOA specialists. However, a surge can be expected as the power and efficiency of SOA is understood by the COIs and the SIGMO team may need to grow accordingly.

The SIGMO is the logical steward of the SOA management strategy and the service metadata for the enterprise. The team should have configuration management skills in its composition. As with any team, a lead member should be identified and given project management responsibilities for monitoring who is assigned to which COI and who will be available for upcoming service development.

The SIGMO team should act as a catalyst and should not get involved in making decisions on domain-specific issues but should focus on technical and alignment issues. Virtual collaboration technology should be employed heavily to communicate issues rapidly across the SIGMO community.

The SIGMO charter should also require the team to take the lead in SOA enterprise change management to ensure that risk mitigation is an integral part of the SOA implementation planning. The SIGMO team would be responsible for establishing and maintaining standard requirements management, configuration management, quality assurance including metrics, and project planning and oversight practices. SOA can only deliver the flexibility and business agility it promises if it is designed for change from the start.

Finally, in the case of the DoD, the SIGMO charter should address the requirement for getting acquisition programs and their milestone schedules aligned and should plan to develop an implementation roadmap for these programs. The team should be tasked with developing and maintaining the SOA management strategy that is to be used in the training and mentoring process.

Conclusion

SOAs make business sense because a single service can be developed incrementally, deployed quickly, and scaled according to demand. In contrast, the stovepipe system requires the bulk of the cost and time needed for scalability to be expended before the system is fielded whether or not it will actually get substantial usage. Because of the time and cost taken for this type of development, advances in technology often eclipse many monolithic systems before they are even fielded.

In the DoD, agile services can be used to replace the plethora of point-to-point interface agreements used to move data between monolithic systems. The services need only publish a single, enterprise-wide interface and, hence, are relieved of the need to build custom interfaces for each and every other service. The mapping, transfer, and utilization of cross service data are managed on-demand by the creation of lightweight services. These agile services are composed, published, and removed quickly under the guidance of a SOA specialist using automated tools.

Service Oriented Architectures represent a shift from brittle business stovepipes towards an agile and responsive service oriented enterprise. The SOA management strategy provides a guide for those developing, publishing, and consuming services. The SOA Implementation Guidance and Management Office helps keep services lightweight and agile and mitigates risk on the way to a service oriented enterprise.