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SOA Governance: More than just registries and repositories

Insight | White paper

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Service-oriented architecture (SOA) governance transcends simply designing and developing Web services and implementing SOA registries, repositories and other like tools. Robust organizational groundwork is required for an SOA implementation to succeed. PricewaterhouseCoopers (PwC) advocates using an SOA governance framework that takes into account people, processes and technology across different SOA domains and levels. Doing this in conjunction with a staged implementation approach can help firms achieve the potential cost savings, flexibility and agility promised by SOA.

Introduction: SOA governance defined

Service-oriented architecture (SOA) promises to better align business and IT priorities through a flexible and modular architecture that provides organizations with insight into processes as well as IT resources across the enterprise. By taking a standards-based approach to building, deploying and maintaining applications through the creation of shared services, businesses can dramatically improve their agility and lower the total cost of ownership (TCO) of their IT infrastructure.

SOA is not one project, but rather an architecture that spans multiple programs and projects. These programs are typically managed by different organizations—both internal and external—in a highly decentralized fashion. Due to the decentralized nature of SOA, deployment and life cycle management tasks tend to be significantly more complex than those associated with traditional monolithic legacy systems. One of the biggest challenges of implementing an SOA architecture, therefore, is aligning cross-organizational efforts to make the initiative easy to maintain and manage.

SOA governance is the discipline of making SOA programs within an enterprise consistent and aligned with holistic business goals and objectives through a wellstructured set of top-down policies, procedures and controls. There are significant differences between managing an SOA program and implementing robust governance mechanisms. While management is about running a program within given time, budget and profitability constraints, governance provides guidelines for executives to run SOA initiatives according to predefined policies, processes and procedures. SOA programs, by definition, have some level of SOA governance. The question is whether SOA governance is ad hoc or systematic in nature.

PwC has created a framework that allows organizations to create a holistic governance structure that is systematic in nature. By providing transparency into SOA policies, processes and decisions, a governance framework helps stakeholders assess that an organization's SOA programs are on track, aligned with business priorities across multiple organization levels and domains, and delivering significant value to the enterprise as a whole.

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Benefits of SOA governance

A successful SOA governance initiative will achieve the following critical goals:

Establish and enforce architectural standards and guidelines. An SOA strategy will adhere to a reference architecture that has been planned, designed and documented with cross-organizational reuse of services in mind.

Empower centralized groups to enforce governance and evolve them as needed. By creating centralized SOA organizational structures that keep different lines of business, departments and workgroups aligned and in compliance with mandated SOA architectural and business process standards, enterprises allow their SOA efforts to grow and change as their business priorities do.

Create an appropriate funding model. SOA governance helps organizations determine how individual workgroups or departments should contribute funds for developing SOA services that will be used throughout the enterprise so as not to overburden any one stakeholder with costs that should be shared across the entire organization.

Develop well-defined guidelines for identifying, modeling, implementing, discovering, consuming and deploying services. By providing mandates from a centralized authority such as a strong SOA governance council, organizations create a consistent way for the services developed by various internal groups to be conceived of, developed and implemented. As a result, the opportunities for reuse—and therefore return on investment—are greatly increased.

A SOA framework

A SOA governance framework that will facilitate accomplishing these critical goals should be based upon different dimensions, governance domains and levels of governance (Figure 1).

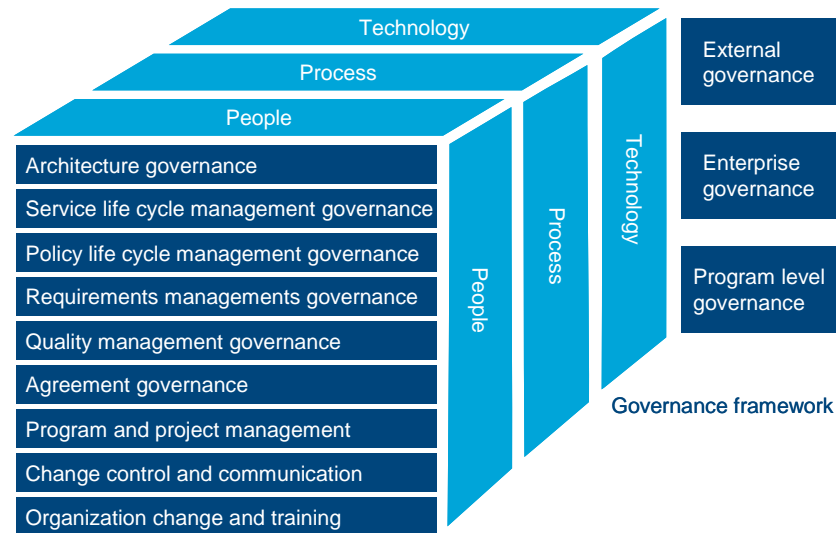


Figure 1. SOA governance framework

Dimensions of SOA governance

As with many aspects of aligning IT and business priorities, SOA governance is described using the dimensions of people, process and technology.

People. The governance organizational structure must be well defined by creating centralized groups that are given the authority to enforce key governance policies, processes and activities. To facilitate this, businesses should implement a detailed responsibility, accountability, contribution, informed (RACI) chart that clearly delineates who is responsible for what. Moreover, a strong leadership and executive sponsorship is essential to implement your organization's SOA initiative.

Process. A robust SOA governance structure will create well-defined issue reporting, conflict resolution, escalation, analysis and approval processes to guard against decentralized SOA projects getting out of control.

Technology. Finally, it's essential to automate as many of the governance processes as possible, including creating repositories for common SOA artifacts such as architecture and design documents and registries for services and their metadata.

The **domains** of SOA governance

SOA governance can be classified into multiple categories, or domains, that are dedicated to managing SOA projects across a number of parameters. These include the following:

Architecture governance. Architecture governance is about enforcing architecture principles, leading practices and standards so that architectural decisions and policies are followed throughout the enterprise in a consistent manner.

Service life cycle management governance. Organizations typically find themselves possessing dozens— if not hundreds—of services created by many different workgroups and departments. These services must be properly categorized using a well-defined service taxonomy, and the entire service portfolio managed so that services are reviewed at every step of the service life cycle.

Policy life cycle management governance. Governance is about defining policies and enforcing these policies. But the policies themselves have their own life cycles. Some of the policies are permanent, but others will need to evolve as the business environment changes—and a governance organization is needed to analyze—and, if appropriate—approve changes to these policies.

Requirements management governance. High-level business requirements for SOA initiatives must be defined in very early stages by executive sponsors and program leaders. It then becomes the responsibility of a governance organization such as the SOA governance committee to enforce these requirements across SOA plans and decisions and impose processes so that they aren't altered without justification.

Quality management governance. Quality governance certifies services for passing established standards for interoperability, reusability, maintainability, performance and reliability before they are moved into production.

Agreement governance. Managing the inevitable conflicts of interests of stakeholders while developing memorandums of understanding (MOUs) and service level agreements (SLAs) is the responsibility of the SOA governance organizations.

Program and project management. There are three important functions to be performed here. First, managing across the SOA program to align service producing projects with service consuming projects. Second, ensuring that key SOA-specific project activities are part of the project plan. Third, identifying the risks associated with implementing SOA and formulating strategies for mitigating those risks. Although risk management is traditionally a function of project management, the governance organization supports this function by identifying the risks specific to SOA implementation.

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Change control and change communication. Since an SOA implementation supports services that are used and reused across the organization, a single change to a service contract can impact many diverse groups. In addition, since an SOA framework includes shared infrastructure—for example, an enterprise service bus or shared security services—making modifications to the shared infrastructure can also impact many diverse groups. Creating an SOA-specific change control board verifies that any service or infrastructure changes are effectively communicated to the stakeholders.

Organizational change management and training. SOA inevitably changes business processes and impacts the way that employees carry out their day-to-day work. Furthermore, SOA involves creating new roles and responsibilities for employees. Organizational change management that includes redesigning the organizational structure, assessing the skills of the current staff, making recommendations for retraining staff to take on new roles and responsibilities, recruiting new staff, and generally helping the organization adapt and embrace the changes are important considerations.

Levels of SOA governance

While SOA support varies from one organization to another, Based on how an organization supports SOA, they need to define and implement SOA governance at different—sometimes multiple—levels. There are three basic levels at which governance can exist: external, enterprise and program levels.

External SOA governance. For a business to implement SOA across multiple organizational boundaries—with the goal of sharing information or streamlining business interactions with business partners or customers—its SOA infrastructure must be fairly mature. Its governance mechanisms should be similarly advanced. And one of the key things the enterprise must do when applying SOA governance to external relationships is to define cross organizational business policies and MOUs that create safeguards against any participating parties impacting the business operations of any of the others.

Enterprise SOA governance. Those businesses taking a top-down approach to SOA across their internal departments or divisions because of an enterprisewide mandate from an executive sponsor should require that the business units participating in the SOA initiative—whether by providing or consuming the services—help define the policies that will govern the decentralized development of services. Such policies must include proper escalation procedures in the event of conflicting requirements or views about defining and developing services.

Program level SOA governance. There are many who recommend that organizations start small with SOA by initiating SOA programs or projects for particular departments or business units. The focus of program-specific

governance then would be on the design-time and run-time governance of services and on managing the service life cycle.

However, even when implementing a relatively small and contained SOA program, organizations should already have an enterprisewide vision and strategy for SOA in place so that governance of any individual project falls under the umbrella of the enterprise SOA governance policies, procedures and processes.

Key SOA governance policies

There is a broad range of possible SOA governance policies, which can be defined at any of the three levels of governance described above. Examples of the types of SOA governance policies—many of which are defined on paper and executed manually rather than using automated tools—include the following:

- **Strategic governance.** These would include anything related to SOA strategy, including who is responsible for creating it, changing it and implementing it.
- **Enterprise governance.** What architectural standards should the enterprise follow? Who defines them? What is the process for adding new standards or products into the approved list? When should a service be defined as an enterprise shared service?
- **Program governance.** These policies are used to define and approve business services, prioritization of service development and deployment, service ownership, and which information systems are the “systems of record” for each particular piece of information.
- **Operational governance.** Sometimes defined as policies for run-time governance, these policies include the security policies, availability policies and performance-related policies, among others.
- **Release management.** When should services and SOA infrastructure be released into production use? When should services be retired? What are the acceptance criteria for releasing the services for use? These are part of release management governance policies.
- **Service life cycle management.** These are policies that determine when and how the services are identified, how service contracts are developed, reviewed and approved, and how services are developed and put into production.
- **Conflict resolution.** Clearly defining the processes and procedures that resolve conflicts of interests among the entities participating in the SOA is an essential type of SOA policy.
- **Change management.** Changes to services and SOA infrastructure must be controlled in order to maintain a “clean” and well-organized SOA environment.

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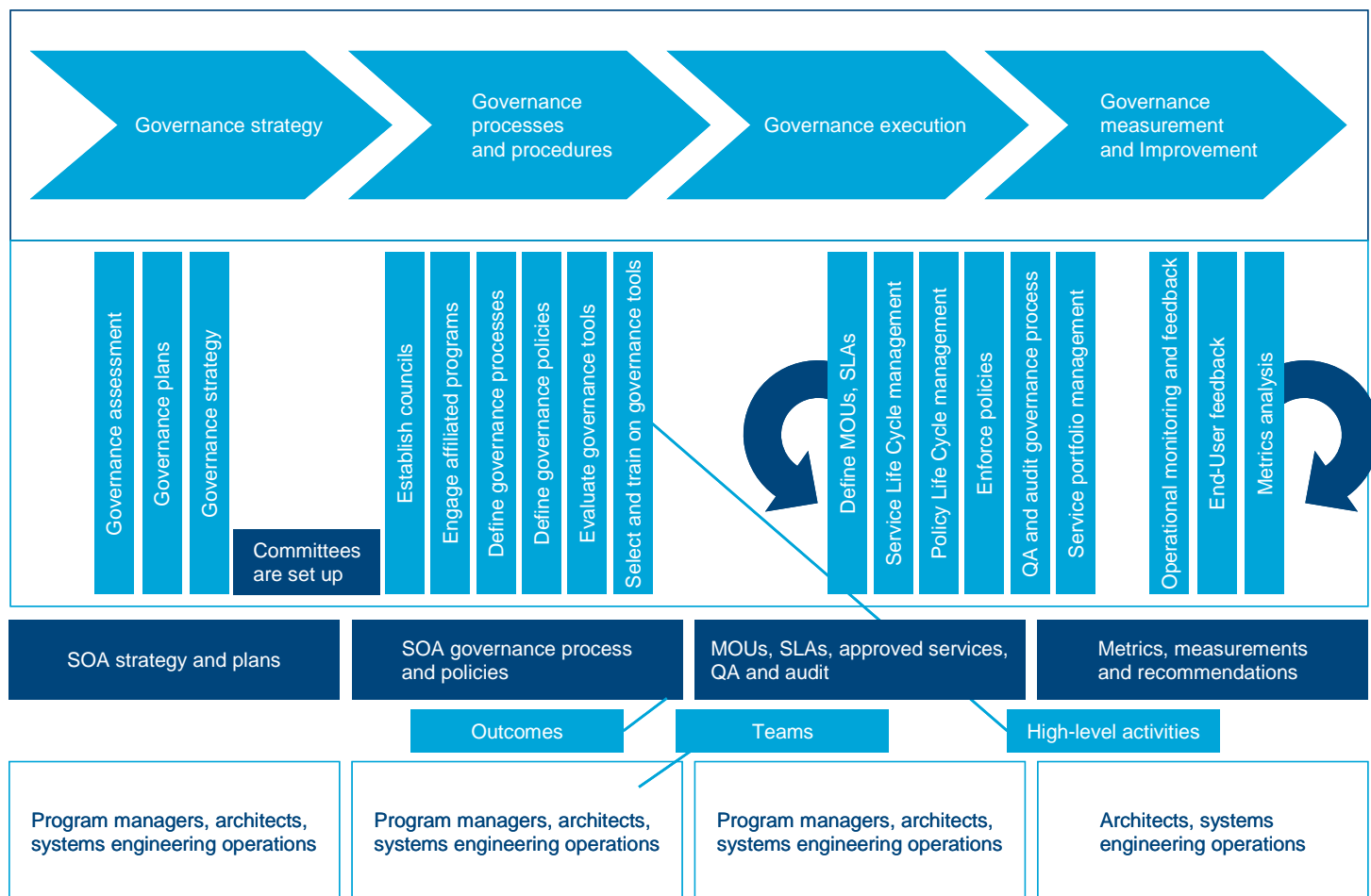
A staged approach to SOA governance

Simply jump-starting an SOA initiative and hoping it will succeed won't work. It's essential to set up the appropriate top-level organizational structures that have the authority to enforce SOA governance across people, processes and technology. The only way to accomplish this is to require the business units, divisions or even external partners that will be participating in the SOA initiative—in short, any group that plans to create or consume services—to help define policies that will guide the development, funding and implementation of services.

One of the most important organizations is the SOA governance council, which is made up of stakeholders from across the organization who intimately understand the business operations of their respective business units, and—most importantly—who are in decision-making positions. This council must also contain people with a strong conceptual understanding of SOA, who can identify the business services, prioritize them, and develop architectural standards and leading practices for implementing them throughout the enterprise. Moreover, the SOA governance council should be chaired by an executive sponsor who is responsible for coordinating funding for the initiative. This can be a complex task, as it is possible that funding will not come from a single source, but that participating business units will contribute to funding the initiative. Other governance councils could include the project management office, a center of excellence and the change control board.

Once these various governance organizations have been established organizations should take a staged approach to governance that takes into account the dimensions, domains and policies for SOA governance (Figure 2).

Figure 2. Implementing SOA governance



This staged approach starts with conducting an initial assessment of the business and IT environment, arranging meetings with stakeholders to understand their concerns, and coming to a consensus that can be used to formulate a preliminary governance strategy.

From that strategy, the governance council can develop the governance policies and processes. Then, as SOA programs or projects are implemented, the governance council is responsible for continuously mentoring stakeholders and monitoring them for compliance. They also act in the role of quality assurance and perform regular audits to assess that quality standards are being met.

Finally, in an operational environment, the governance council measures the effectiveness of SOA using a predefined set of metrics and measurements. Often referred to as run-time governance, these metrics are compared against targets, and the results reported to management along with recommendations for improvement.

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Conclusion: Effective SOA governance

SOA governance is a much broader concept than commonly thought, and requires a clear understanding of organization's primary vision, goals and objectives for implementing SOA. SOA governance policies and procedures must be defined at many different levels within the organization in order to achieve these goals and objectives—and have much further reach than simply covering design and development of Web services using standards such as Web Services Policy and various SOA registries, repositories and like tools. Although these things are certainly important, there is a lot of organizational groundwork that must be accomplished before an SOA implementation that delivers value can be achieved.

By implementing SOA in an evolutionary manner through incremental development and deployment of business applications and reuse of business components, organizations have a much better chance of building the right architecture and adopting the right practices needed to bring a successful SOA vision to fruition.

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