

**Oracle® Practitioner Guide**

A Framework for SOA Governance

Release 3.0

**E14494-03**

September 2010

A Framework for SOA Governance, Release 3.0

E14494-03

Copyright © 2009, 2010, Oracle and/or its affiliates. All rights reserved.

Primary Author: Stephen G. Bennett

Contributing Author: Cliff Booth, Dave Chappelle, Bob Hensle, Anbu Krishnaswamy, Jeff McDaniel, Mark Wilkins

#### **Warranty Disclaimer**

THIS DOCUMENT AND ALL INFORMATION PROVIDED HEREIN (THE "INFORMATION") IS PROVIDED ON AN "AS IS" BASIS AND FOR GENERAL INFORMATION PURPOSES ONLY. ORACLE EXPRESSLY DISCLAIMS ALL WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT. ORACLE MAKES NO WARRANTY THAT THE INFORMATION IS ERROR-FREE, ACCURATE OR RELIABLE. ORACLE RESERVES THE RIGHT TO MAKE CHANGES OR UPDATES AT ANY TIME WITHOUT NOTICE.

As individual requirements are dependent upon a number of factors and may vary significantly, you should perform your own tests and evaluations when making technology infrastructure decisions. This document is not part of your license agreement nor can it be incorporated into any contractual agreement with Oracle Corporation or its affiliates. If you find any errors, please report them to us in writing.

#### **Third Party Content, Products, and Services Disclaimer**

This document may provide information on content, products, and services from third parties. Oracle is not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.

#### **Limitation of Liability**

IN NO EVENT SHALL ORACLE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL OR CONSEQUENTIAL DAMAGES, OR DAMAGES FOR LOSS OF PROFITS, REVENUE, DATA OR USE, INCURRED BY YOU OR ANY THIRD PARTY, WHETHER IN AN ACTION IN CONTRACT OR TORT, ARISING FROM YOUR ACCESS TO, OR USE OF, THIS DOCUMENT OR THE INFORMATION.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

---

---

# Contents

<b>Send Us Your Comments</b> .....	vii
<b>Preface</b> .....	ix
Document Purpose.....	x
Audience.....	x
Document Structure.....	x
How to Use This Document.....	xi
Conventions .....	xi
<b>1 Introduction</b>	
1.1 What is the Oracle SOA Governance Framework?.....	1-1
<b>2 SOA Governance</b>	
2.1 The need for SOA Governance .....	2-2
2.2 SOA Governance Relationships.....	2-3
<b>3 SOA Governance Model</b>	
3.1 SOA Governance Reference Model.....	3-2
3.2 SOA Portfolio Governance .....	3-3
3.3 Service Lifecycle Governance.....	3-5
3.4 SOA Solution Lifecycle Governance .....	3-6
3.5 SOA Vitality Governance.....	3-7
3.6 SOA Organization Governance .....	3-9
3.6.1 Empowered Structures .....	3-9
3.6.1.1 SOA Steering Boards.....	3-10
3.6.1.2 SOA Architecture Authority.....	3-10
3.6.1.3 SOA Center of Excellence (aka SOA Enablement Team).....	3-10
3.6.1.4 Service Advisory Council.....	3-11
3.6.1.5 Service Engineering.....	3-11
3.6.1.5.1 Embedded Service Factory .....	3-11
3.6.1.5.2 Service Factory .....	3-11
3.6.1.5.3 Shared Resource Service Factory .....	3-12
3.6.1.5.4 Enterprise Service Factory.....	3-13
3.6.2 Education & Training.....	3-13

3.6.3	Change Management .....	3-13
3.6.3.1	Encouragement Model.....	3-14
3.6.3.2	Enforcement Model.....	3-14
3.6.3.3	Enticement Model.....	3-14

## 4 Continuous Improvement of SOA Governance

4.1	Assessment.....	4-2
4.2	Plan and Define .....	4-5
4.2.1	SOA Guiding Principles & Policies.....	4-5
4.2.2	SOA Portfolio .....	4-6
4.2.3	SOA Governance Processes.....	4-7
4.2.4	SOA Organization .....	4-7
4.2.5	Funding Model.....	4-8
4.2.6	SOA Governance Infrastructure .....	4-8
4.2.6.1	SOA Asset Management.....	4-9
4.2.6.2	Policy Management and Enforcement .....	4-9
4.2.6.3	Consumer Management .....	4-9
4.2.6.4	SOA Monitoring and Management .....	4-9
4.2.6.5	Oracle Enabling Technologies .....	4-10
4.2.7	Metrics .....	4-10
4.3	Deploy and Execute.....	4-11
4.4	Manage and Monitor .....	4-11
4.5	Analyze and Evaluate .....	4-11

## 5 Summary

### A Key Concepts

A.1	Governance .....	A-1
A.1.1	Corporate Governance.....	A-2
A.1.2	IT Governance .....	A-3
A.1.3	Enterprise Architecture Governance .....	A-3

### B Further Reading

## List of Figures

1-1	SOA Governance Reference Model .....	1-2
1-2	SOA Governance Continuous Improvement Loop .....	1-3
2-1	Sample SOA Challenges .....	2-3
2-2	SOA Governance Relationships.....	2-4
2-3	Example Governance Challenge.....	2-5
2-4	Realistic Industry Standard Deployment .....	2-6
3-1	No Single SOA Governance Model .....	3-1
3-2	SOA Governance Reference Model .....	3-2
3-3	SOA Governance Continuous Improvement Loop .....	3-8
3-4	Example SOA Structure .....	3-10
4-1	SOA Governance Continuous Improvement.....	4-1
4-2	Oracle SOA Maturity Model .....	4-3
4-3	Governance & Organization Capabilities.....	4-3
4-4	SOA Governance Influences.....	4-5
4-5	SOA Guiding Principles.....	4-6



---

---

# Send Us Your Comments

## **A Framework for SOA Governance, Release 3.0**

**E14494-03**

Oracle welcomes your comments and suggestions on the quality and usefulness of this publication. Your input is an important part of the information used for revision.

- Did you find any errors?
- Is the information clearly presented?
- Do you need more information? If so, where?
- Are the examples correct? Do you need more examples?
- What features did you like most about this document?

If you find any errors or have any other suggestions for improvement, please indicate the title and part number of the documentation and the chapter, section, and page number (if available). You can send comments to us at [its\\_feedback\\_ww@oracle.com](mailto:its_feedback_ww@oracle.com).

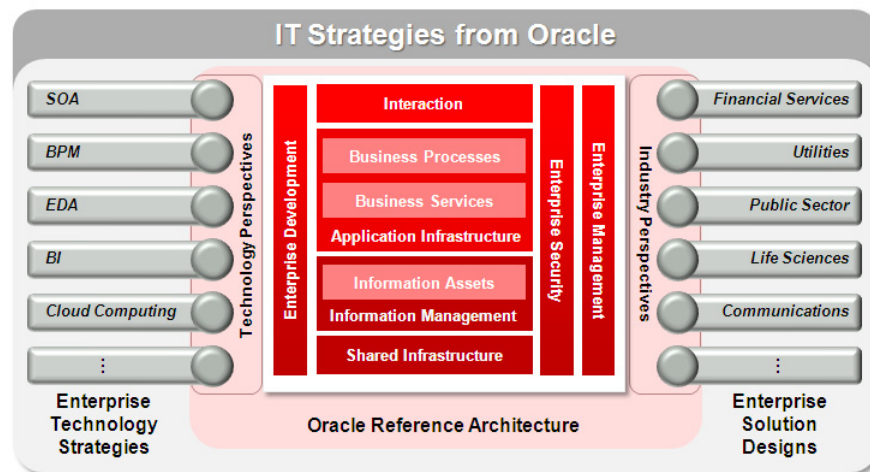


---

---

# Preface

**IT Strategies from Oracle (ITSO)** is a series of documentation and supporting collateral designed to enable organizations to develop an architecture-centric approach to enterprise-class IT initiatives. ITSO presents successful technology strategies and solution designs by defining universally adopted architecture concepts, principles, guidelines, standards, and patterns.



ITSO is made up of three primary elements:

- **Oracle Reference Architecture (ORA)** defines a detailed and consistent architecture for developing and integrating solutions based on Oracle technologies. The reference architecture offers architecture principles and guidance based on recommendations from technical experts across Oracle. It covers a broad spectrum of concerns pertaining to technology architecture, including middleware, database, hardware, processes, and services.
- **Enterprise Technology Strategies (ETS)** offer valuable guidance on the adoption of horizontal technologies for the enterprise. They explain how to successfully execute on a strategy by addressing concerns pertaining to architecture, technology, engineering, strategy, and governance. An organization can use this material to measure their maturity, develop their strategy, and achieve greater levels of success and adoption. In addition, each ETS extends the Oracle Reference Architecture by adding the unique capabilities and components provided by that particular technology. It offers a horizontal technology-based perspective of ORA.
- **Enterprise Solution Designs (ESD)** are industry specific solution perspectives based on ORA. They define the high level business processes and functions, and the software capabilities in an underlying technology infrastructure that are

required to build enterprise-wide industry solutions. ESDs also map the relevant application and technology products against solutions to illustrate how capabilities in Oracle’s complete integrated stack can best meet the business, technical, and quality of service requirements within a particular industry.

This document is part of a series of documents that comprise the SOA Enterprise Technology Strategy, which is included in the IT Strategies from Oracle collection.

Please consult the [ITSO web site](#) for a complete listing of SOA and ORA documents as well as other materials in the ITSO series.

## Document Purpose

A Practitioner’s Guide provides insight and guidance when working with a particular type of technology and address the common concerns faced by enterprises and practitioners.

<b>Topic Areas</b>	Business & Strategy							
	Organization & Governance							
	Architecture & Infrastructure							
	Information							
	Engineering & Modeling							
	OA & M							
		EDA	SOA	BPM	BI	MDM	CM	B2B

**Enterprise Technology Strategies**

Effective SOA governance provides enterprises with visibility into, and oversight of, the relationships and interdependencies that connect services to other elements of the SOA across the enterprise. It encompasses people, process, and technology to effectively manage and optimize your organization’s investment in SOA and improve decision-making.

This Practitioner’s guide provides an approach which eases the transition and on-going execution of an enterprise’s service-oriented architecture (SOA) by providing a means to reduce risk, maintain business alignment, and show the business value of SOA investments.

## Audience

The primary audience for this guide is for those who are responsible and accountable for the governance of an SOA program and environment. In addition this guide is also applicable to IT managers, project manager, enterprise architects, application architects, developers, and other stakeholders who are responsible and accountable for delivering projects and managing the SOA environment.

## Document Structure

This document is organized into the following sections.

[Chapter 1](#) - provides an overview of the Oracle SOA Governance Framework which covers an approach for developing a SOA Governance model.

[Chapter 2](#) - provides an overview of SOA Governance and its relationship to existing governance disciplines.

[Chapter 3](#) - provides a description of the constituent parts that make up a SOA Governance model.

[Chapter 4](#) - provides a high-level approach by developing a SOA Governance model.

[Chapter 5](#) - provides a summary of this document.

[Appendix A](#) - provides background information on a number of existing governance disciplines.

[Appendix B](#) - provides a quick reference on where to find further information.

## How to Use This Document

This document should be read by everyone that is interested in learning about or leveraging SOA Governance.

Chapters 1 and 2 should be read by everyone who wishes to gain an understanding of the key concepts involved in SOA Governance. Chapter 3 and 4 should be ready by management and architects that have an interest in understanding the different aspects of developing a SOA Governance model..

Refer to the *ORA Glossary* document for descriptions of key terms.

## Conventions

The following typeface conventions are used in this document:

Convention	Meaning
<b>boldface text</b>	Boldface type in text indicates a term defined in the text, the glossary, or in both locations.
<i>italic text</i>	Italics type in text indicates the name of a document or external reference.
<u>underline text</u>	Underline text indicates a hypertext link.

In addition, the following conventions are used throughout the SOA documentation:

*"Service" v. "service"* - In order to distinguish the "Service" of Service Oriented Architecture, referred to throughout the SOA ETS document series, the word appears with its initial letter capitalized ("Service"), while all other uses of the word appear in all lower-case (e.g. "telephone service"); exceptions to this rule arise only when the word "service" is part of a name, such as, "Java Message Service" ("JMS"), "Web Service", etc.



---

---

# Introduction

Leading companies are gaining operational efficiencies and business agility through adaptable, re-usable business processes and services built on a truly flexible **Service-Oriented Architecture (SOA)** foundation. SOA has allowed these companies to adopt an approach to architecture to assist in closing the business and IT gap by delivering the appropriate business functionality in a timely and efficient manner.

Many companies that have approached SOA via a pilot project have not been seeing the same demonstrated SOA benefits once they have deployed a fully development SOA project. While pilot projects achieved a level of reuse, they have tended to be within one division, but as soon as a project boundary crosses multiple divisions, additional and new challenges are encountered.

One of the key disciplines to assist in addressing these challenges is SOA Governance. While traditional governance has been around a long time, it has been seen as a slow paper-driven process. SOA has heightened the need and importance of having a formal SOA governance model that eases the transition of an enterprise to SOA by providing a means to reduce risk, maintain business alignment, drive a cultural change and show business value of SOA investments through a combination of people, process, and technology.

The governance needs for a SOA program differ from traditional governance approaches. The speed at which decisions need to be made, access to information in a timely manner, the greater number of assets and their relationships - all contribute to the requirements for a different approach to SOA Governance. While many vendors focus on purely addressing these requirements with technology, Oracle understands that successful SOA Governance requires a combination of people, process and enabling technology. When implemented properly, SOA Governance delivers significant, tangible benefits that optimize the ability for your organization to achieve the expected business value from its SOA investments.

It is widely accepted that SOA fails to achieve the benefits it promises without a successful SOA Governance strategy. The challenge for each enterprise is to determine which SOA Governance strategy is best suited to their environment.

## 1.1 What is the Oracle SOA Governance Framework?

The Oracle SOA Governance Framework is a governance approach which eases the transition and on-going execution of an enterprise's service-oriented architecture by providing a means to reduce risk, maintain business alignment, and show the business value of SOA investments.

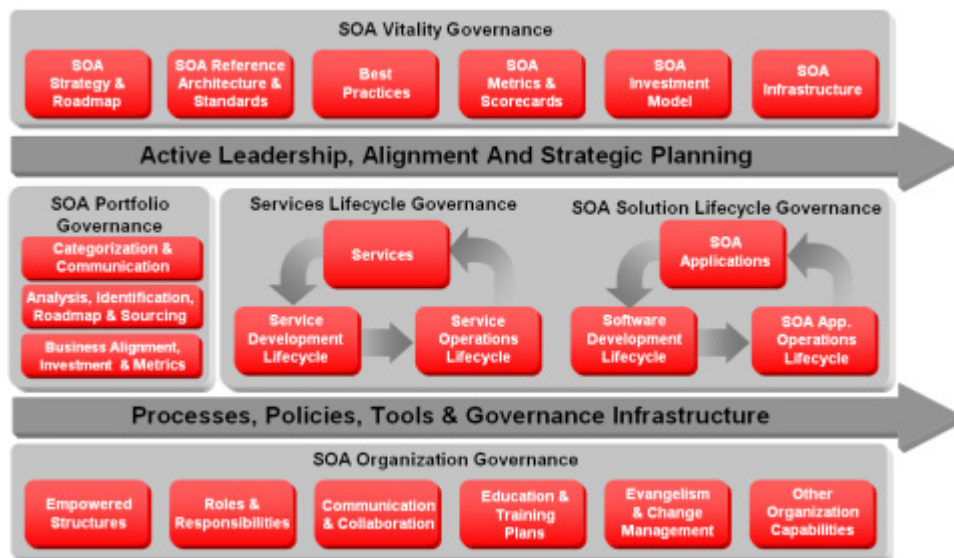
The framework helps identify the unique challenges faced by enterprises executing SOA and provides a framework for addressing these challenges and increasing the efficiency of the SOA.

The Oracle SOA Governance Framework complements traditional governance approaches by defining the principles, policies, processes, roles and infrastructure required to uplift an enterprise's existing governance strategy.

The Oracle SOA Governance Framework consists of the following.

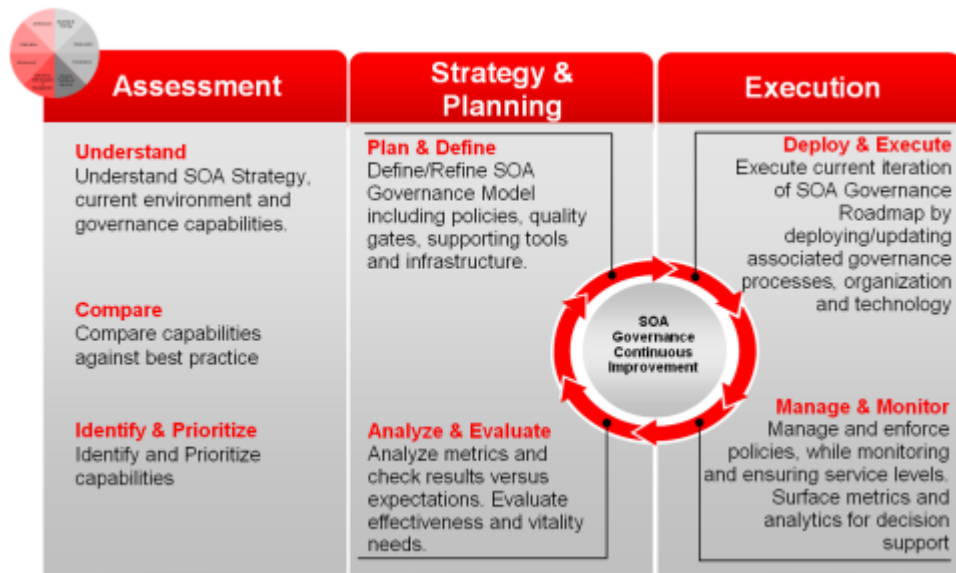
- **SOA Governance Reference Model(SGRM)** - The SOA Governance Reference Model is a generic but complete model that is utilized as a baseline SOA governance model to expedite the process of tailoring a SOA Governance Model for an enterprise. All aspects of the SOA Governance Reference Model are reviewed and considered for customization to the enterprise's environment.

**Figure 1-1 SOA Governance Reference Model**



- **SOA Governance Continuous Improvement Loop** - SOA Governance should be viewed as a program and not a project, therefore the phases of the SOA Governance Continuous Improvement Loop measures progress and updates the SOA Governance Model when needed to perform any required course correction.

Figure 1–2 SOA Governance Continuous Improvement Loop



The phases of the Oracle SOA Governance Continuous Improvement Loop include:

- **Assessment:** The framework extols an incremental approach to defining and deploying a SOA Governance model, the assessment phase focuses on uncovering the current SOA challenges and prioritizing a SOA Governance roadmap.
- **Strategy & Planning:** A major aspect of the SOA Governance framework is the definition and future refinement of a customized SOA Governance model. This phase defines an appropriate SOA Governance model and an associated SOA Governance roadmap.
- **Execution:** This phase focuses on the execution of the SOA Governance roadmap and managing and enforcing policies while monitoring and ensuring the service levels.



---

---

## SOA Governance

As a discipline, governance has been with us for many a year, but with the advent of Enterprise SOA the need has been heightened for enterprises to take governance as a discipline more seriously. See [Appendix A](#) for a high-level description of various governance disciplines.

Many of the early definitions of SOA were very technology-focused and the differences between SOA and web services technology were blurred. A major side effect of this is the misperception that SOA Governance can be solved by technology alone. Effective SOA Governance requires equal focus on people, process, and enabling technology. In addition there is a misconception that SOA Governance is limited to governing the lifecycle of services from creation through deployment.

Effective SOA Governance provides enterprises with visibility into, and oversight of, the relationships and interdependencies that connect services to other elements of the SOA across the enterprise. It encompasses people, process, and technology to effectively manage and optimize your organization's investment in SOA and improve decision-making.

---

---

**SOA Governance Definition:** *“An agile and efficient decision and accountability framework to effectively direct and assist in realizing the benefits of SOA, while encouraging a cultural evolution in how an organization delivers SOA to the enterprise”*

---

---

As with all governance disciplines, SOA Governance has its challenges, but the benefits are more than worth the effort.

- **Link Vision and Strategy** - SOA Governance is the means by which you connect vision and strategy directly to the Services, business processes, and other assets and artifacts within your SOA. SOA Governance requires visibility into areas such as business impact analysis, architectural compliance, policy compliance, asset usage, SOA cost/benefit analysis, and SOA **ROI (Return on Investment)**. This assists in reducing and managing SOA risk by giving a proactive visibility into the current SOA program which allows for any course correction to be executed in a timely manner. It is about understanding when, where, how, and by whom SOA assets are being developed and used, and whether that use accomplishes your goals. With this alignment and oversight, you can translate corporate objectives into real, tangible solutions that address business challenges.
- **Improve Decision-Making** - Making bad decisions-or taking too long to make the right ones-costs time and money that your organization cannot afford. The right decisions require visibility into the right information. Without a governance registry-repository it is challenging to answer SOA Governance questions with

any confidence. SOA Governance defines the process by which you collect and disseminate the necessary information to make critical IT investment decisions. The right solution facilitates a closed-loop information exchange between all of your stakeholders to ensure timely, accurate decisions on key business issues.

- **Effectively Manage Change** - With SOA, the speed and ease with which you can affect change improves substantially. However, the ability to move that fast is only an advantage when you understand the impact of change. Even the tiniest modification in the SOA can impact your entire organization. Without the ability to understand and manage change, you are effectively blind to its potential impact. SOA Governance requires visibility into the relationships and interdependencies of an organization's SOA components so you can foresee the impact of change. This visibility is essential in reducing the risk associated with change and ensuring desired business results.
- **Enable Control** - Policies need to be governed in much the same way as SOA Assets. Organizations need visibility into the policies that exist, as well as the targets to which they are applied. Policies provides a mechanism to control the behavior of assets and provide decision-making guidelines for individuals.
- **Foster Enterprise-wide Collaboration** - A successful SOA requires seamless collaboration among all stakeholders. SOA Governance is instrumental in fostering that interaction by defining roles and responsibilities and clearly articulating a role-relevant perspective for each participant especially the IT executive, so they can understand how their actions relate to the big picture. Through cross-functional collaboration, SOA Governance makes it easier to proactively identify and resolve issues and prevent negative impacts on development and production timelines.
- **Track SOA Investments and Returns** - Understanding the landscape of existing IT investments, future IT needs, and their associated financial impact has always been an important challenge - even more so with SOA. Such an architecture shifts away from monolithic applications to an environment where individual services get combined on the fly to form dynamic composite applications. In this situation, your investment decisions rely upon a much more granular view of the infrastructure. With SOA, the focus moves from the application down to the underlying Services, business processes, and other assets that comprise the application. SOA Governance tracks and analyzes IT performance at the component level to empower you with pinpoint management and control over investments. SOA Governance uses this granular view to determine the value of individual services as part of the calculation of overall ROI.

## 2.1 The need for SOA Governance

Over the years, Oracle has assisted many customers to overcome their SOA challenges. Below is a sample of the challenges encountered.

**Figure 2–1 Sample SOA Challenges**

- |                                                    |                                             |
|----------------------------------------------------|---------------------------------------------|
| • Lack of tools and infrastructure                 | • Maturity of Web Services Standards        |
| • Standards proliferation                          | • Service Sprawl                            |
| • Standards Compliance                             | • Registry Sprawl                           |
| • Business/IT Relationship                         | • SOA Portfolio Management                  |
| • Multiple Silo-ed SOA's                           | • “Right-Click Architecture”                |
| • Lack of Best Practices                           | • Culture Change                            |
| • Organization Friction                            | • Change Management                         |
| • Confusing priorities                             | • Lack of appropriate operational processes |
| • Enterprise vs LOB Decisions                      | • Lack of skills and experience             |
| • Lack of SOA Roadmap                              | • Hype versus Reality                       |
| • Funding                                          | • Track & Communicate Progress              |
| • Charge-Back Models                               | • Policy Enforcement (Automated, Manual)    |
| • Lack of appropriate service engineering approach | • Fragile SOA Implementation                |

For Enterprise SOA to be successful, enterprises must navigate through political and technical obstacles to cross several internal and external boundaries. Enterprise SOA requires the use of **Business Process Management (BPM)** to generate the business value required by the senior business executives. These processes stretch throughout the value chain, across internal lines of business and touch partners, suppliers, etc. In addition, Enterprise SOA services by their very nature are distributed throughout the enterprise and a level of boundary crossing and collaboration is required for application teams to develop composite Services and to utilize these Services. As soon as multiple **lines of business (LOB)** are involved there are collaboration challenges and siloed SOA pilot project benefits are not fully translated at the multiple-LOB level.

While many enterprises view SOA Governance as an afterthought, it is important that SOA Governance is designed and deployed as soon as possible. There is a misconception that an enterprise does not require SOA Governance until their portfolio contains 50 Services. But if an enterprise can't execute governance over 5 Services, then 50 Services will be far too overwhelming.

While SOA Governance is required from day 1, SOA Governance does not have to be heavyweight but can be lightweight with part-time virtual roles, or additional agenda items. SOA Governance should be deployed in an iterative and incremental manner. This allows SOA Governance to grow with your SOA initiative. If treated as an afterthought, SOA Governance will require more significant change management.

As previously stated, governance as a discipline has been around for a long time with various levels of interest, but SOA has heightened the need for governance. Not all of the challenges in [Figure 2–1](#) are SOA specific. This emphasizes that for SOA Governance to be successful, it must be seen as an extension of an enterprise's existing formal or informal governance disciplines such as IT and **EA (Enterprise Architecture)** Governance.

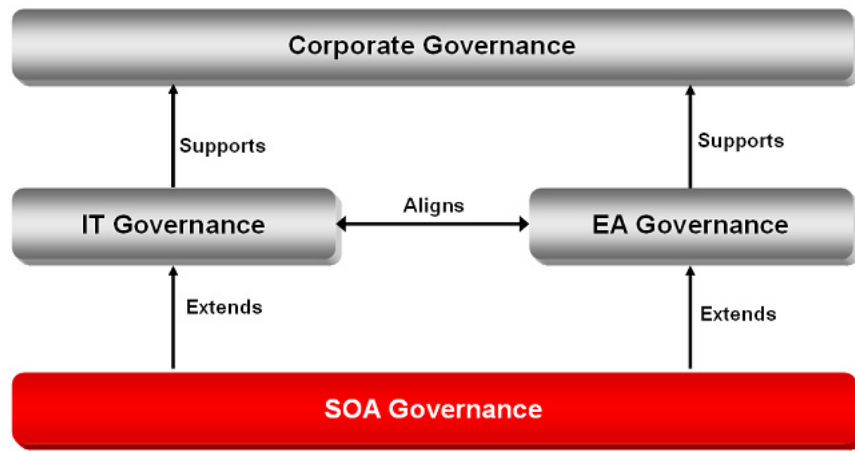
## 2.2 SOA Governance Relationships

SOA heightens the importance of addressing existing challenges that IT has been encountering for years such as architecture alignment, functional ownership and

standards compliance. Therefore, it is important to understand the relationship between SOA Governance and existing governance disciplines.

Each enterprise has their view of their governance structure and hierarchy but for the purposes of this document the following governance relationships will be referenced.

**Figure 2–2 SOA Governance Relationships**



SOA Governance extends an enterprise's existing IT and EA governance disciplines to cater for the nuances of new SOA assets and policies to achieve the optimum business value. Without extending these existing governance disciplines, enterprises open themselves to creating a silo-ed governance discipline that will potentially duplicate existing coverage areas of the core governance disciplines in their enterprise.

In addition, focusing purely on SOA Governance and not taking into consideration IT and EA governance can lead to IT and EA challenges undermining the benefits that SOA Governance is attempting to achieve. This requires governing not only the execution aspects of SOA but also the strategic planning activities.

This view is also re-enforced by the Open Group:

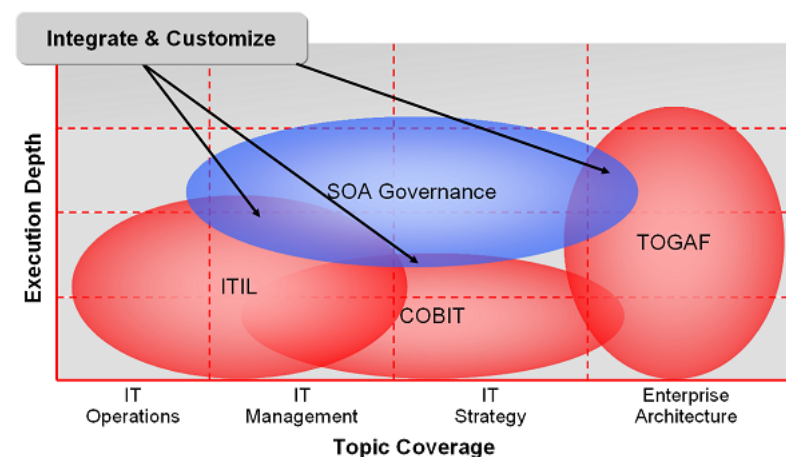
---

**Open Group Governance Relationships:** *“SOA Governance should be viewed as the application of Corporate Governance, IT Governance and EA Governance to Service Oriented Architecture. In effect, SOA Governance extends IT and EA Governance ensuring that the benefits that SOA extols are met. This requires governing not only the execution aspects of SOA but also the strategic planning activities”*

---

Even when the decision to extend your existing governance discipline has been made, it raises some challenges. To highlight some of these challenges, let's assume that enterprise THFC wishes to deploy SOA Governance within their environment. Even though practically unrealistic let's assume for illustrative purposes that enterprise THFC are evaluating a number of industry frameworks (i.e. [TOGAE](#), [COBIT](#), and [ITIL](#)).

Figure 2-3 Example Governance Challenge

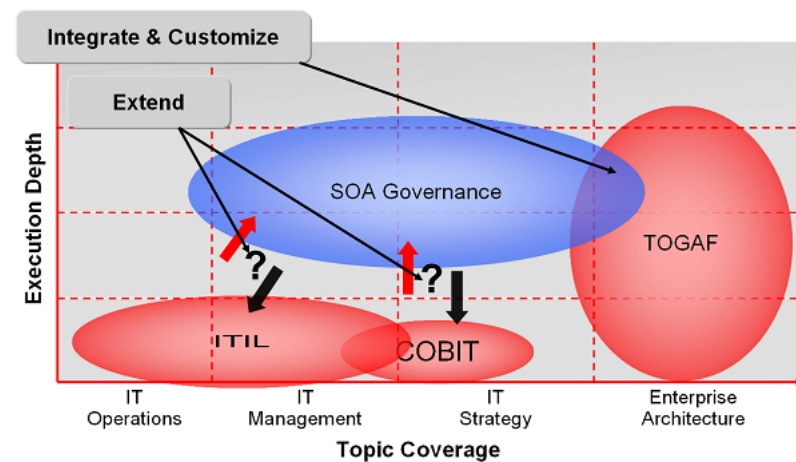


Even though this figure is not 100% accurate or realistic, it illustrates some of the key challenges that enterprises may encounter when defining and deploying SOA Governance and extending existing governance disciplines.

- **TOGAF (The Open Group Architecture Framework)** is a detailed method and set of supporting resources for developing an Enterprise Architecture. Figure 2-3 shows a relatively comprehensive execution depth. This is due to TOGAF's **ADM (Architecture Development Method)** which is a prescriptive framework on executing TOGAF. TOGAF defines a framework and guidelines for architecture governance.
- **COBIT (Control Objectives for Information and related Technology)** is a set of best practices for IT management. COBIT provides a set of measures, indicators, processes and best practices to assist enterprises in maximizing the benefits derived through the use of information technology and developing appropriate IT governance and control in a company.
- **ITIL (The Information Technology Infrastructure Library)** is a set of concepts and policies for managing information technology infrastructure, development and operations.

Because these industry standard frameworks are from different standards bodies the first challenge that an enterprise would encounter is an approach to align and integrate them into a cohesive governance strategy. Now overlaying the scope of SOA Governance onto these industry standard frameworks highlights even more integration points between the various governance disciplines.

In reality even if Enterprise XYZ decided to use all of these standard frameworks, they would have customized and deployed them in an incremental and pragmatic manner. For example, it is common practice not to deploy ITIL in a big bang approach but to deploy a specific service such as "Change Request".

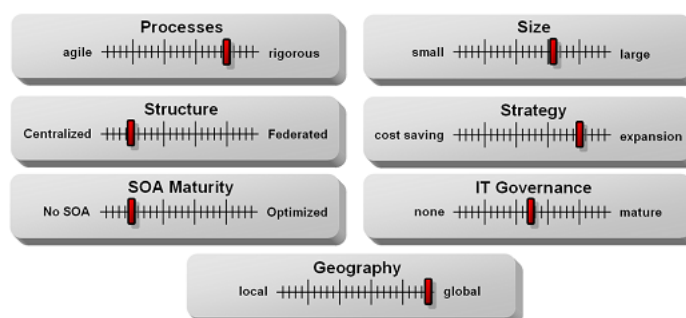
**Figure 2-4 Realistic Industry Standard Deployment**

This figure highlights additional challenges that the enterprise may encounter. The decreased focus area of the deployed governance disciplines such as ITIL now raises a dilemma. Does the enterprise increase the scope of ITIL or increase the scope of SOA Governance? Enterprises that have informal governance approaches tend to have even more difficulties around defining their SOA Governance model due to multiple silo-ed governance processes and policies.

## SOA Governance Model

There is no single model of good SOA Governance because each enterprise has differences and nuances. Enterprises have existing IT organization structures in place; their geographical footprint, size of organization, and level of SOA maturity can differ; and they have their own working culture and political considerations. The model may also be affected by differences in existing IT and EA governance regime.

**Figure 3–1 No Single SOA Governance Model**



An enterprise needs to answer a number of questions to define their SOA governance model.

- What decisions need to be made for your organization to have effective SOA Governance?
- Who should make these SOA Governance decisions?
- How will these SOA Governance decisions be made and monitored?
- What structures, processes, communication, tools should be deployed?

It is not possible to have a single model of good SOA Governance but having a SOA Governance Reference Model assists enterprises in expediting the construction of their SOA Governance model; and captures best practices and patterns as a basis for a common approach. In effect a SOA Governance model must:

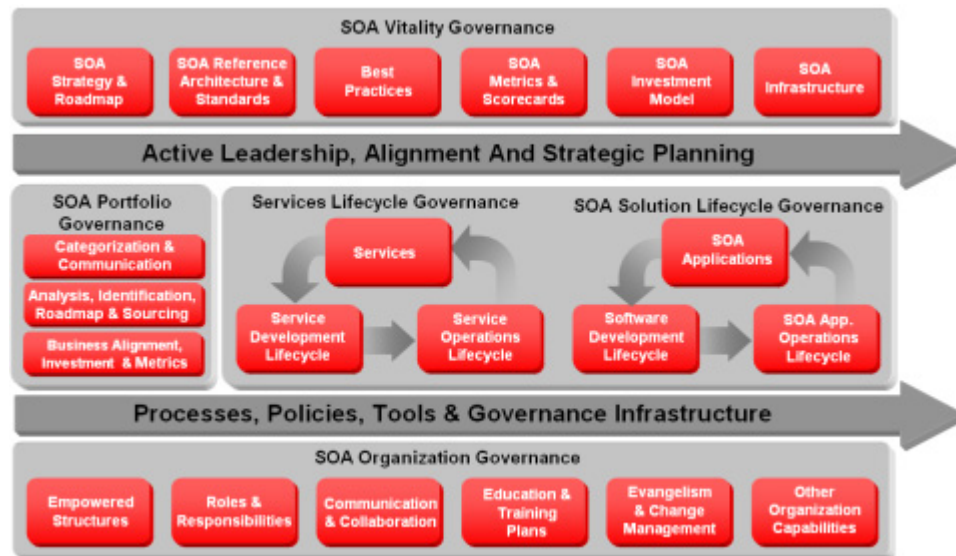
- Enable the definition of policies and processes to guide management into making effective SOA decisions
- Define structures which enable the policies and processes.
- Enable management of all SOA assets not just services
- Aid in minimizing or avoiding potential conflicts of interest and in making decisions that are fair to all parties

- Enable collaboration from stakeholders to adhere to processes and authority structures
- Enable authorized groups to encourage/enforce alignment to SOA architecture and cultural orientation

### 3.1 SOA Governance Reference Model

So what aspects need to be considered as part of your overall SOA Governance model? A common narrow view of regarding SOA Governance is that it equates to applying technology to the service lifecycle. But SOA Governance has to focus not only on the development aspects of SOA but also on the strategic requirements. In addition, SOA Governance has to make sure that any investments made into SOA assets continue to add value.

**Figure 3–2 SOA Governance Reference Model**



A SOA Governance model can be categorized as five inter-related groups:

- SOA Portfolio Governance
- Service Lifecycle Governance
- SOA Organization Governance
- SOA Solution Lifecycle Governance
- SOA Vitality Governance

## 3.2 SOA Portfolio Governance



A key area for SOA Governance is in the area of SOA Portfolio Management, which manages SOA projects, SOA assets, and associated metadata in a holistic manner and is a key enabler for Service Identification. While enterprises not accustomed to managing portfolios today might feel this area of SOA Governance is an overhead or as a barrier to entry for SOA this can be addressed by scoping the portfolio within the boundaries of the SOA initiative.

SOA Portfolio Management must:

- Provide the means to manage the metadata for any type of software asset from business processes and Web services to patterns, frameworks, applications, and components
- Map the relationships and interdependencies that connect software assets to the SOA, and the SOA to business objectives
- Support SOA project planning, impact analysis, investment decisions, collaboration, and reuse by providing stakeholders with visibility and traceability of Services and their supporting artifacts
- Provide the means to apply governance policies to assets and to systematize reuse of those assets
- Include tools and metrics to measure and communicate both compliance with governance policies and the ROI of the SOA transformation effort

It is critical that SOA Governance monitors and regulates all of the areas and phases of SOA Portfolio Management:

- Identification & Categorization
- Evaluation & Approval
- Prioritization & Roadmap
- Funding & Charge-backs
- Sourcing & Ownership

To enable SOA Governance to monitor and regulate these areas a repository is vital. For example, a key part of Service Identification and discovery is the ability to search for existing and planned Services. Having a standard business-oriented taxonomy enables a more business-aligned identification and discovery process and brings a number of benefits:

- Better communication between the IT department and the business by having a common taxonomy for requirements.
- Assists in eliminating redundancy in duplicate Services and applications and thus maximizes reuse.

It is common for these business-oriented taxonomies to be based on an enterprise's functional model that also drives the formation of a number of SOA Business Domain Portfolios. These portfolios contain a set of discrete, reusable Services/assets that share some common business cohesiveness. While it is common to categorize Services by multiple means, such as by layering, technology, etc., it is best practice to have (at a minimum) Services categorized by your functional model. It should be noted that the taxonomy should not map to the enterprise's organizational model but to the enterprise's functional model, as organizational models tend to change more often than the Services and functions that an enterprise offers.

It is common to allocate funding by SOA portfolio which feeds into the overall development of a portfolio delivery plan detailing the prioritization and dependencies of Services and SOA projects. SOA Governance should review the funding and charge-back models utilized by the various SOA Portfolios to highlight if they need to be reconfigured to fit changing conditions. i.e. in tough economic times shift funds into investments with lower risk and shorter-term returns. This can be a delicate process as over investing in one area means you will under-invest in another.

SOA Governance policies within this area are not only key within the identification/justification and approval of Services/ SOA projects but also making sure the taxonomy and classification of Services are inline with agreed policies and standards. It is common to see roles such as Service librarians and SOA portfolio owners to assist with the process in combination with a technology solution.

Without SOA Governance policies within this area it is common to see Service sprawl whereby duplicate Services exist and/or Services existing in production that are not being utilized. These challenges can be caused by Services being identified that are not in alignment with business requirements and duplicate Services created across different business units.

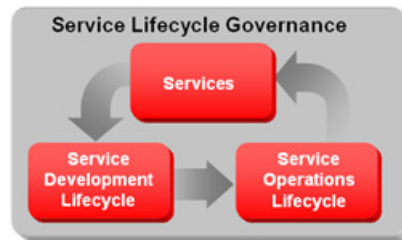
Once justified, SOA projects and Services feed into the development of an SOA Roadmap/release plan. An SOA Roadmap provides guidance to the SOA initiative allowing multiple projects to progress in parallel yet remain coordinated, ultimately resulting in a common end goal that provides value greater than the sum of the individual projects. The SOA Roadmap consists of three fundamental parts:

- Program-level efforts
- A portfolio of projects that build specific business solutions
- A portfolio of Services

A key tenet of SOA Governance is having access to timely and accurate information, such as impact analysis and dependency tracking, to make informed decisions around SOA projects and Services. Every stakeholder, from executive to developer, must have a clear, easily understandable view of the SOA assets and of the relationships and interdependencies that connect the assets to each other, to the policies that govern their use, and to the projects that produce and consume them.

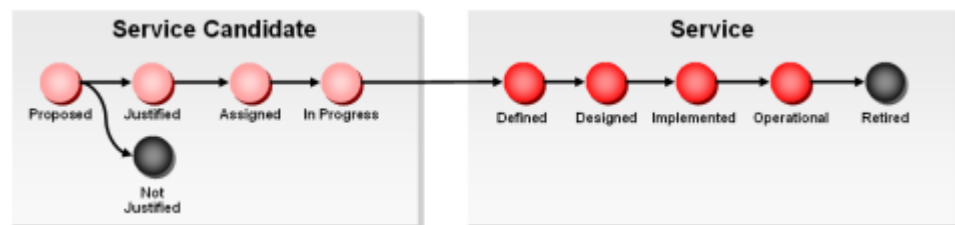
Unfortunately, it is not uncommon for enterprises to neglect SOA Governance around SOA Portfolio Management until major challenges are encountered. An enterprise implementing SOA Portfolio Governance must assess and evaluate how these processes integrate with their existing governance processes such as infrastructure portfolio planning and application portfolio planning.

### 3.3 Service Lifecycle Governance



An area that tends to get the lion's share of focus is Service lifecycle governance. It is imperative that both the design-time and run-time aspect of a Service is governed as each is equally important. Example goals of Service lifecycle governance are:

- Services are delivered that align and support the defined business and IT objectives.
- Services are delivered in a consistent manner that comply with the defined policies, standards and guidelines to promote interoperability, re-use, and agility.
- Services meet security requirements such as access control and encryption.
- Services are published and classified against an agreed taxonomy to promote a standardized discovery process which promotes service visibility and reuse.
- Multiple versions of Services are managed in a standardized manner.



One key aspect that needs to be in place before Service lifecycle governance can be deployed is defining and documenting the states of which a Service can go through. The Service lifecycle tracks the Service from inception through retirement, and includes the Service's evolution through multiple Service versions.

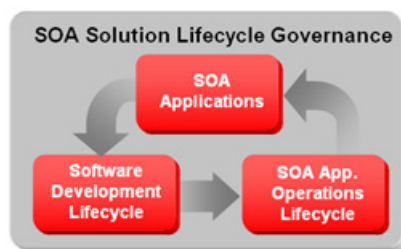
In addition to defining the Service lifecycle states, it is also key that an engineering process has been designed which documents how the Service states are transitioned. (See the *Software Engineering in an SOA Environment* document for more detail)



Service lifecycle governance requires the visibility and traceability of assets throughout the entire Service lifecycle. If you consider that Services are interconnected with multiple assets in an SOA environment, (i.e. policies, other Services, applications, components, etc.). It requires the creation, validation, and enforcement of policies across that lifecycle, and requires the means to measure and report on policy compliance as part of the metrics that will define and verify the business value of the SOA. If you don't have this visibility, a change to a Service or asset can have devastating impact on other applications, assets, and projects.

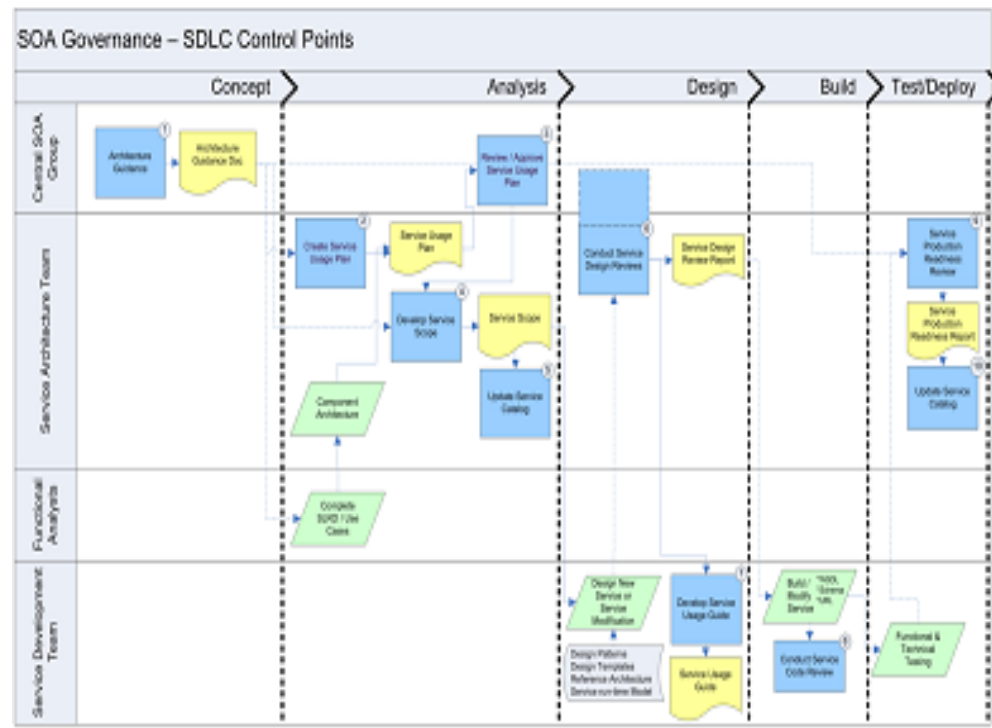
Effective Service lifecycle governance requires proper SOA policy management and enforcement to ensure that constituent components operate as intended, within design parameters. This is critical for visibility into policy compliance and **QoS (Quality of Service)** metrics. Such visibility, in turn, enables the SOA initiative to continuously evolve and mature.

### 3.4 SOA Solution Lifecycle Governance



While much focus is given to the governance of the Service lifecycle it is also advantageous to govern the delivery of SOA solutions. Example goals of SOA solution lifecycle governance are:

- SOA solutions are identified that align with business and SOA objective before given funding.
- SOA solutions are delivered in-line with the approved SOA reference architecture.
- SOA solutions are reviewed for harvest opportunities.
- Governance of asset consumption whereby SOA solutions are monitored for appropriate Service reuse.
- ...



Applying governance across the SOA solution lifecycle requires defining and updating the enterprise's organizational structures and processes. An example is defining a SOA project approval process that assists enterprises in evaluating a project's appropriateness and alignment with the agreed SOA Roadmap. This process tends to supplement an enterprise's existing project investment process.

Another example is complementing an enterprise's existing software development lifecycle process by adding formal design and architecture evaluation reviews at key inspection points. This ensures projects are aligned with the agreed policies such as alignment against established architectural criteria and business objectives. For each of these processes, it is necessary to understand the participation required of any of the governance organizations and the nature of that participation.

As with Service lifecycle governance, SOA solution governance requires visibility and traceability of assets throughout the entire SOA solution lifecycle, as well as the enforcement of standards and policies.

### 3.5 SOA Vitality Governance



SOA can be seen as a journey where enterprises are required to plan strategically and act tactically. Therefore, it is imperative that any SOA investments made by an enterprise are routinely reviewed, and remains current, accurate, and most importantly, relevant. In essence enterprises should view their SOA investments as living assets and execute a continuous improvement feedback loop to maintain their value and relevance.

The Oracle SOA Governance framework contains a SOA Governance Continuous Improvement loop that enables enterprises the ability to define and deploy their own focused and customized SOA Governance model.

**Figure 3–3 SOA Governance Continuous Improvement Loop**



In addition to the continuous vitality of a SOA Governance model it is also important that SOA assets that enable governance be routinely reviewed.

Example of SOA assets that should be routinely reviewed are.

- SOA Strategy & Roadmap
- SOA Reference Architecture
- Standards & Best Practices
- Processes such as service engineering, service identification, etc.
- SOA Metrics & Scorecards
- SOA Organizational Structure
- Services

The continuous feedback loop can be activated via a number of different events.

Examples of these events include:

- **Strategic Change**

Assets should be reviewed in the event of a strategic business, IT, or SOA change. For example, a change in the business strategy of the enterprise (maybe via an M&A) may change the intent and focus of the current SOA initiative. Therefore the SOA strategy and associated SOA roadmap should reviewed to make sure it is still relevant or the appropriate updates are made.

- **Operational Exception**

Assets should be reviewed when a number of duplicate operational exception events occur. For example, maybe there are a number of projects that do not align with the SOA Reference Architecture. Rather than having an enforcement approach, look at the root-cause of the exception. The cause could be the result of some new best practices, updated SOA Reference Architecture design patterns, etc. If required, the appropriate SOA assets should be reviewed and updated accordingly with the new/updated patterns.

- **Technology Revision**

Assets should be reviewed when a technology revision event may require SOA Assets to be updated. For example, new SOA security standards may have been released by OASIS and are available in the new version of the service bus. Therefore the SOA Reference Architecture and SOA Infrastructure should be reviewed and updated accordingly.

- **Periodic**

Assets should be reviewed on a periodic basis if no other event has forced a review. Different periodic review timings should be allocated to the different classes of SOA assets.

A key part of any continuous improvement feedback loop is capturing and analyzing metrics and making the appropriate and needed adjustments to the SOA Governance Model and SOA assets. This assists in the overall execution and management of the SOA initiative.

## 3.6 SOA Organization Governance



The most challenging and misunderstood aspect of SOA is the effect and requirements it has on the enterprise and its employees. SOA Governance requires the establishment of a viable and pragmatic organizational and change management model. Governance can be seen as an impediment by certain stakeholders. Therefore tools must be utilized to ease and automate as many processes and policies as possible. Examples of these tools include registries, repositories, policy management systems, policy compliance testing systems, policy enforcement systems and testing/diagnostic systems. Even though automating the SOA Governance processes minimizes the opportunities that stakeholders can circumvent it, there are still a number of human decision points that need to be made.

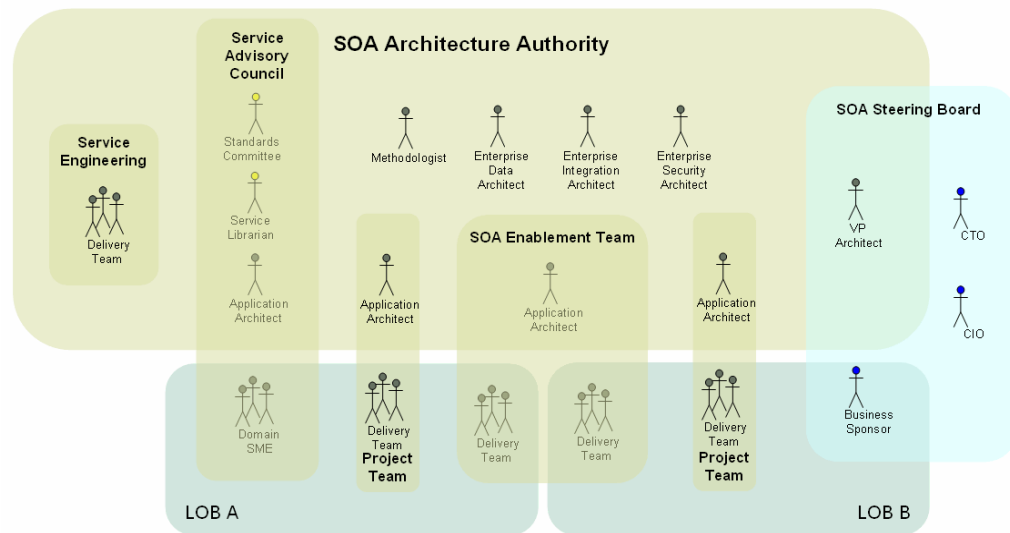
### 3.6.1 Empowered Structures

Traditional governance brings to mind the setting up of management boards or steering committees. While these structures have value they are not the only organizational structures required. SOA has heightened a number of change management requirements. Therefore, any organizational and change management model must cater for the increased levels of collaboration and quicker governance decisions required by architects and projects teams.

Successful SOA initiatives require active leadership and none more so than acquiring some level of executive sponsorship which empowers newly formed or updated structures with not only the mandate but the appropriate authority. Successful SOA Governance starts from the top to drive adoption and commitment. The level of active leadership actually drives the design of the SOA Governance model.

A key aspect of SOA Governance is the updates or creation of new governance structures to define/monitor and enforce policies surrounding the enablement of the SOA initiative. The number and names of these structures is less important than the roles and responsibilities they are focused on. The names of the structures are arbitrary as an IT steering board, IT committee and architecture review board could all perform the duties within different enterprises.

Figure 3–4 Example SOA Structure



### 3.6.1.1 SOA Steering Boards

Leadership structures such as IT/ SOA Steering Boards tend to be staffed with senior management stakeholders who provide the executive sponsorship for the SOA initiative and set the business priorities. It is advantageous to have both business and IT representatives to set and define the vision and strategy as well as establish the appropriate funding models. The SOA Steering Board should also be the last point of reference for any exception management decisions that need to be made. In many enterprises the roles performed by this structure can be addressed by existing IT steering boards or as extensions of IT steering boards.

### 3.6.1.2 SOA Architecture Authority

The SOA Architecture Authority not only enables the strategy execution as defined by the SOA steering board, but also is the custodian over the official SOA Reference Architecture. This structure tends to be staffed by internal experts, but in the early stages can be supplemented by external experienced practitioners. Roles focus around the different aspects of SOA architecture and methodology. From defining approved standards, processes and products to adjudicating architectural priorities and issues. In many enterprises the roles performed by this structure can be addressed by the enterprise architecture team or an extension of the enterprise architecture team.

### 3.6.1.3 SOA Center of Excellence (aka SOA Enablement Team)

A SOA Center of Excellence (COE) allows enterprises to focus more resources and funding on innovation and project delivery while reducing the complexity involved in executing SOA. The SOA COE supports project teams in a variety of ways, from making available experts as a SOA skills and resource base, to enabling overall corporate competency development. While this team should be seen as a project enabler they do have the charter to assure SOA governance compliance. This team tends to be staffed by experience SOA architects who understand the enterprise's SOA Reference Architecture, associated standards, best practices and defined SOA governance policies. In many enterprises the roles performed by this structure can be addressed by extensions to existing structures such as Integration Competency Centers.

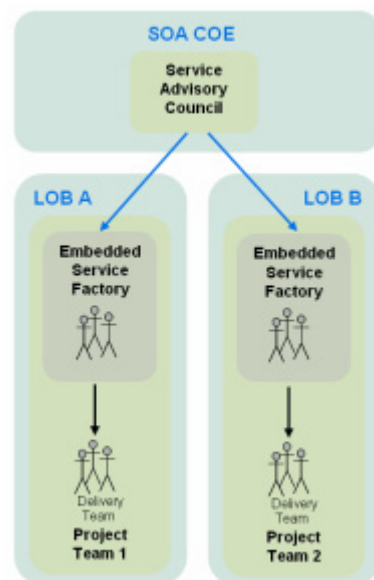
### 3.6.1.4 Service Advisory Council

It is common for enterprises to define structures that are the custodians of the Service Portfolios. Sample duties include maintaining the integrity of the taxonomy and metadata, assisting with Service Candidate approval and with the development of a Services blueprint, and monitoring the Service usage/reuse. Example roles include Service registrar, Service portfolio owners and business domain SME's.

### 3.6.1.5 Service Engineering

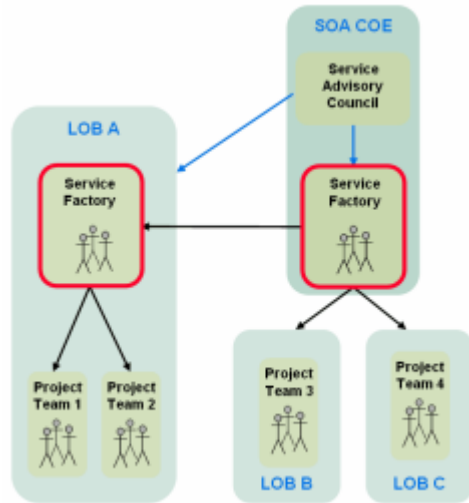
It is common for enterprises to separate the development of applications from the development of Services as each approach can utilize a different development methodology and eases the option of outsourcing. Each approach requires a different mindset, processes, and organizational structures. Below are samples of the possible patterns that can be used to address Service engineering structures.

#### 3.6.1.5.1 Embedded Service Factory



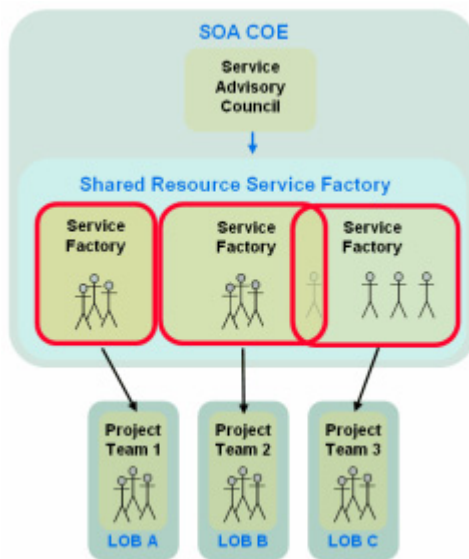
An embedded Service factory is regularly used in initial SOA project efforts and small SOA initiatives. This model provides a single unit that is responsible for producing Services for "each project team" and is considered part of the project team to which they are assigned. They alleviate project management reporting concerns and the high response needs of a project. It is important that each embedded Service factory communicates with the Service advisory council to maintain a strategic focus by balancing short-term goals of individual projects and long term SOA goals.

#### 3.6.1.5.2 Service Factory



Early on in a customer's SOA maturity, it is common for a Service factory to be deployed within the LOB where the project/program is being executed. But as more LOB's develop SOA solutions they in-turn will want to deploy their own Service Factory. This is initially fine but as more LOB's come online the communication, alignment, resource, and skills needs becomes a burden. Therefore a centralized Service factory can be utilized. Service Advisory Council assists in maintaining a strategic focus by balancing short-term goals of individual projects and long term SOA goals.

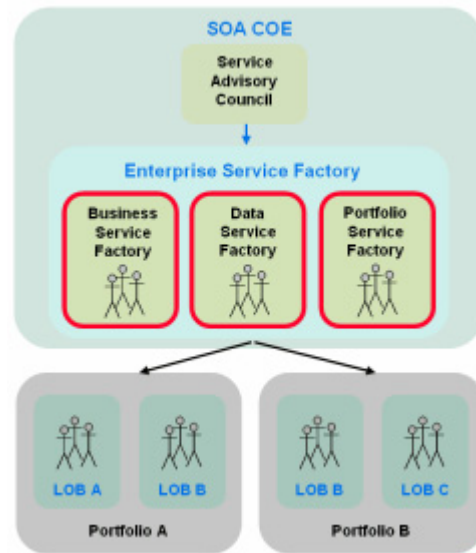
**3.6.1.5.3 Shared Resource Service Factory**



Shared resource service factories are regularly used in SOA initiatives where SOA skills are at a premium and there is an increasing adoption of SOA projects across the enterprise. This model provides resources at the central IT level to support individual project specific producer requirements while increasing resource sharing opportunities. It also allows skills and resource sharing between Service factories

while still having a focused services delivery team. This leads to improved customer relationship and increased customer responsiveness.

#### 3.6.1.5.4 Enterprise Service Factory



The Enterprise Service Factory model is used in more mature SOA initiatives with considerable enterprise adoption. This model provides a unit that is responsible for producing and maintaining Services for the whole organization. The Enterprise Service Factory is sub-divided into specific business and/or technology areas for better skills and Service classification focus. This leads to an effective environment to foster business and technology knowledge in IT staff via rotational opportunities.

### 3.6.2 Education & Training

An enterprise needs to approach education on multiple fronts, i.e. include both strategy aspects and technology aspects. Enterprises must inform their employees regarding the enterprise's SOA strategy and how their work contributes to it, and how their environment and role will change. Employees have to feel confident that the SOA initiative is "real" and the enterprise has to address the "Ignore and it will go away" attitude of some employees. Education has to be addressed at all levels within an enterprise from developers to executives. SOA requires an enterprise to be a learning organization. Employees require continuous education, must have the room to grow and must feel that their opinions are being listened to. It is rare that all employees will accept the way in which their roles and environment will change. With this in mind it is important to identify the employees who are champions, laggards and cynics; and deal with them appropriately.

### 3.6.3 Change Management

For SOA to be successful an enterprise must change its behavior to make it effective. Therefore change management is a serious consideration for SOA. Culture change is not something that can be achieved by flicking a switch on/off and hoping that the way "people act, inter-act and collaborate" changes overnight.

Therefore enterprises must not under-estimate the impact on culture change and make sure they have an approach to cater for this fear of change. Resistance to the change must be accounted for and expected. And therefore the human side of SOA

Governance should be addressed systemically. Consider the following as part of a change management approach.

- Identify and engage all impacted stakeholders from executives to developers.
- Communicate early and often regarding the message and have a central location for program information accessibility, such as a SOA initiative portal
- Make the case and rationale for selecting SOA as an approach
- Inform stakeholders of the changes to their environment and their role. Define metrics to help align individual behavior and performance
- Include lower-level employees in the decision process and implementation plans. This increases the likelihood to gain commitment. People are more committed to decisions to which they feel they had input.
- Obtain broad buy-in in areas like the Future State Vision, goals, strategy, etc.
- Provide training and mentoring both technical and business.
- Perform team-building sessions among the major players that need to work closely
- Have strong, active, visible, vocal and continual support from the sponsor
- Pro-actively communicate governance policies and if needed explain more than once. Ensure updates to policies are properly distributed with feedback solicited.

Most change efforts fail because they are not given the sustained attention, commitment, and time to take hold. Execute change management too slowly and an enterprise risks losing momentum because the initiative does not seem important enough and gets lost in the day to day priorities. Execute change management too fast and an enterprise risks leaving people behind and when stakeholders do not understand why the change is happening they will tend to resist it.

To assist in changing behavior a number of models (known as the 3E's) should be considered.

#### **3.6.3.1 Encouragement Model**

The encouragement model also known as the hope strategy, focuses around traditional teams such as the Enterprise Architecture group whereby they define standards, best practices, products to utilize, patterns, best practices, etc. The EA group then "encourages" teams to use these standards. The EA group has the mandate to define standards but generally lack any authority to force their usage. This tends to be the most common and unfortunately the least successful model.

#### **3.6.3.2 Enforcement Model**

The opposite end of the spectrum is the enforcement model also known as the stick strategy, whereby the defined standards are enforced onto project teams. Project teams are given ultimatums; use the standards defined or pay the consequences. Examples of these consequences range from career restrictions, placements on maintenance projects, and even termination of employment. This model tends to be the most successful but unfortunately can lead to low morale.

#### **3.6.3.3 Enticement Model**

The enticement model also known as the carrot strategy, links inducements to project success. Example inducements are bonuses, assignments to interesting projects, enhanced career goals, etc. Delivering a project on-time is not the only measure by which a project will be deemed successful. Example metrics focus around reuse,

business/ SOA alignment, Service contribution, etc. Measures and rewards communicate the values of the organization and help to build the collective responsibility that will actually change behaviors.

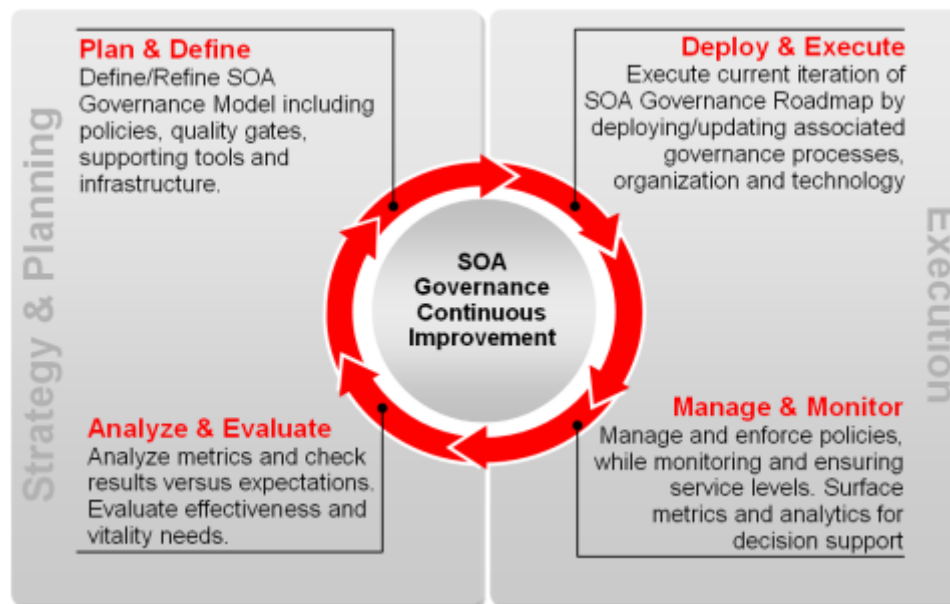
It is recommended that enterprises use a combination of the enticement and enforcement models. An enterprise can start with the enticement model but with the project teams knowing that you have the authority to utilize the enforcement model when deemed necessary. Where a large resistance is expected it is common for enterprises to build a skunk works team from newly hired employees to engineer the services required by the enterprise.



## Continuous Improvement of SOA Governance

SOA Governance must be seen as an on-going program rather than a one-off project. Enterprises need to make sure that they continue to meet their current SOA demands while at the same time fulfilling the enterprises long-term aspirations and goals for SOA. Therefore enterprises should approach their SOA Governance needs in an iterative and incremental manner. The enterprise needs to deploy an SOA Governance model that is appropriate for their maturity and then transition to their desired future state. Enterprises that have not started down the SOA path yet, should take a lightweight approach to SOA Governance with minimal infrastructure requirements and organization and process updates.

**Figure 4-1 SOA Governance Continuous Improvement**



The goal of the SOA Governance Continuous Improvement Loop is to enable enterprises the ability to define and deploy their own focused and customized SOA Governance model. The SOA Governance Framework consists of a SOA Governance Reference Model which is utilized as a baseline model, and a SOA Governance Continuous Improvement Loop which is a definition/improvement feedback process to define a focused and customized SOA Governance model.

One key area that must be fully understood before embarking on defining an enterprise SOA Governance model is the understanding and definition of the expected goals, benefits and objectives. What are the enterprise's SOA goals /benefits and objectives? Without this understanding and agreement an enterprise will not have a solid foundation on which governance decisions can be made. What are the enterprise's business objectives and how does the SOA benefits enable and align with the enterprise to reach its goals? This is the start of basing governance decisions around SOA project identification and developing an associated SOA project portfolio roadmap.

Too many enterprises fall into the analysis/paralysis trap whereby enterprise architecture groups lock themselves away for 12-18 months to plan their SOA Governance model. A more pragmatic approach is to focus on the near term (i.e. the first 100 days) where the SOA Governance roadmap covers not only your tactical needs but also your strategic needs. Only the near term activities require a level of detail, as the SOA Governance roadmap can be viewed as having a sliding window where at the end of the near term the medium term slides across and with it comes the appropriate level of detail. This approach requires executing on multiple streams, an execution tactical stream which focuses on the next 100 days that should address known near term challenges, and then only focusing on one to three projects within one LOB. And also a Strategic Stream which focuses on the medium and longer term aspects of the SOA Governance roadmap. This should focus on a wider deployment and adoption - and should start to focus on the highly challenging aspects of cross organization LOB projects.

## 4.1 Assessment

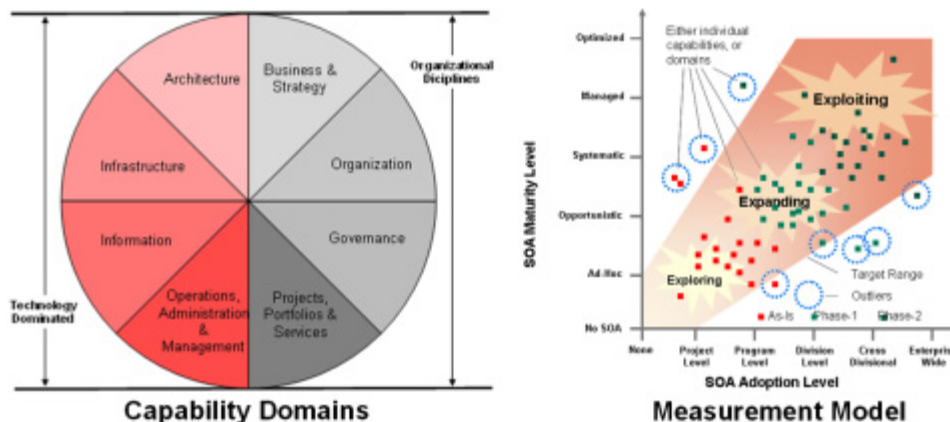
Unfortunately, enterprises tend to focus on SOA Governance in a reactionary manner. So SOA governance is not taken seriously until an enterprise has encountered a number of challenges. So understanding these challenges gives an indication on where an enterprise should start their focus. A SOA Governance assessment can highlight where to start and what specific areas need to be addressed. This assessment can be executed as a separate focused activity or as part of an overall SOA Roadmap building exercise. (See *Creating an SOA Roadmap* document ).

Prior to defining a SOA Governance model it is common for enterprises to develop a high-level SOA Roadmap. An SOA Roadmap provides guidance to the SOA initiative allowing multiple projects to progress in parallel yet remain coordinated and ultimately resulting in a common end goal that provides value greater than the sum of the individual projects.

Generally, the most effective planning horizon for an SOA Roadmap is two to three years. This could be longer or shorter depending on the planning cycles for each enterprise. The initial phases (e.g. first six months) of the roadmap will contain much greater detail than the later phases. This is appropriate and by design. The SOA journey is a journey of discovery, incremental improvement, and regular course corrections. The SOA Roadmap should be regularly reviewed and updated. The business never stays static, so do not expect the SOA Roadmap to remain static either.

As part of the SOA roadmap building process it is common for enterprises to execute a current state assessment. Attempting to capture a full, detailed description of the current state of an IT environment of a large enterprise can lead to analysis paralysis. To avoid this problem, Oracle has developed an approach that uses a focused scope and a pragmatic, time-boxed approach. The underlying goal is not to fully capture an IT environment current state; rather it is to evaluate the current state relative to the capabilities that are required to successfully adopt SOA.

Figure 4–2 Oracle SOA Maturity Model



The current state is measured based on the Oracle SOA Maturity Model. Using this approach to assess the current state of the SOA initiative provides a consistent measurement scale while keeping the effort focused on capabilities important to SOA success and avoiding the scope creep that frequently undermines current state evaluation efforts. The Oracle SOA Maturity Model includes over ninety capabilities that capture the best practices that Oracle has collected over many years working with a wide variety of companies. These capabilities provide the detail necessary to accurately measure and guide the progress of an SOA initiative.

Figure 4–3 Governance & Organization Capabilities

Governance	Organization
Service Development	Organizational Structure
Governance	Architecture Authority
Solution Development	Education and Training
Governance	Knowledge and Skills
Service Portfolio	IT Executive Sponsorship
Governance	Organizational Change Management
Solution Portfolio	
Governance	
Standards Vitality	
SOA Infrastructure Change Management	
Metrics and Monitoring	
Exception Management	
Policy Management	
Governance Principles	

Capability heat maps can be used to visually identify these low maturity capabilities. The capabilities heat map colors to each of the capabilities based on the maturity score recorded for that capability. The heat maps draw immediate attention to the capabilities that require attention. These capabilities should be considered as part of the early phases of the SOA Governance Roadmap.

Capability Name	Description
Governance Principles	The defining of the high-level governance principles that guide the development of the SOA Governance Model

Organizational Change Management	The desire and ability to drive the necessary changes to the organization.
IT Executive Sponsorship	The SOA initiative needs an executive sponsor from IT to foster adoption and overcome organizational and political impediments.
Knowledge and Skills	An environment in which both product and SOA skills are developed and enhanced within an internal learning system.
Education and Training	IT employees spend an adequate number of training hours each year as part of an overall training plan in SOA technologies, inter-personal/business skills and other SOA disciplines.
Architecture Authority	Organization charts, roles, and responsibilities of the centralized shared services architecture function in the IT department, including sufficient resources to be effective.
Organizational Structure	Organizational charts, roles and responsibilities to make and enforce SOA Governance policies.
Policy Management	The processes for defining, deploying, enforcing, monitoring, and auditing policies with regards to the functionality and operation of services.
Exception Management	The procedure for handling exceptions to defined standards or procedures.
Metrics & Monitoring	The definition of key metrics and using the metrics to drive behavior.
SOA Infrastructure Change Management	The procedures for determining the impact of changes to Service infrastructure and maintaining version control and approving proposed changes.
Standards Vitality	The procedures for ensuring that all standards, internal and industry, are enforced and are regularly refreshed to ensure continuing applicability.
Solution Portfolio Governance	On-going governance policies and practices concerning the portfolio of solutions being created.
Service Portfolio Governance	On-going governance policies and practices that guide the creation of a robust Service Portfolio.
Solution Development Governance	On-going governance policies and practices that promote and ensure adherence a Service-oriented solution development approach including change management.
Service Development Governance	On-going SOA governance policies and practices that promote and ensure adherence to a reusable Services development approach including change management.

Once the capabilities have been assessed, enterprises need to start assessing and addressing aspects of SOA Asset Management that are key within the near term (i.e. the first 100 days). Initially it is to understand what existing SOA assets that your enterprise has, i.e. Services (inc. duplicate and unused), components, business processes, etc. Having a SOA Reference Architecture (See *ORA SOA Foundation* document) and a Service engineering framework (See *Software Engineering in an SOA Environment* document) are key assets here in terms of setting standards, best practices, patterns and policies around defining Service contracts, Service design, etc. so that a high-level validation can occur on the state of these assets.

So with the SOA Governance assessment completed, enterprises need to define upfront their long term SOA Governance roadmap that not only supports and aligns with their SOA Strategy Roadmap but also addresses the challenges found within the assessment. It is imperative that all assessment findings are communicated to all stakeholders as part of the initiation of continual change management.

## 4.2 Plan and Define

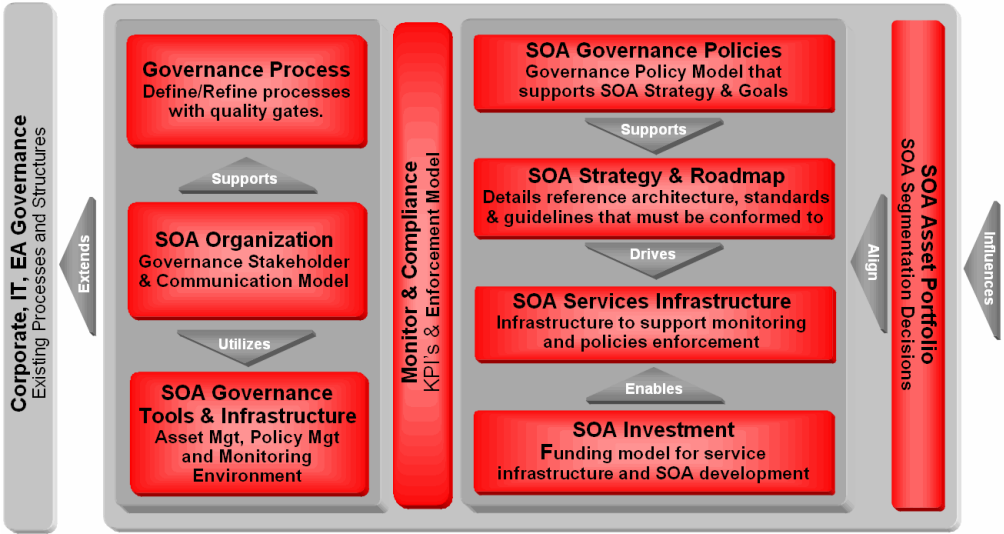
Enterprises approaching SOA can not assume automatic conformance. Therefore early stages of an SOA Governance approach tend to be more interventionist while mature SOA transitions to a more seamless governance. It is critical that an enterprise's approach to SOA is not more difficult than it has to be. Otherwise pushback from the stakeholders will ensue. Therefore, the SOA Governance model should be appropriately aligned with the SOA maturity of the enterprise.

Planning should be very iterative in nature. Experience has shown that it is invaluable to have a pragmatic roadmap that covers the near, medium and long-term which details prioritized steps towards a target state. But each phase should be of decreasing detail as invariably earlier assumptions on which the roadmap will be based will not all be accurate. Especially when working with areas such as culture and process change. When defining or refining the SOA Governance model it can be advantageous to have a "benevolent dictator" that can shortcut many of the Organization and Governance issues that may arise.

Keep in mind that when defining an SOA Governance model it must integrate/extend the existing governance disciplines found within the enterprise. This can mean extending or refining an existing governance process or governance structure rather than defining a new process and structure from scratch. Taking into consideration the challenges that the enterprise is encountering and the outcome of the assessment, the Plan and Define activities for defining an SOA Governance model should consider the people, process and technology aspects.

The following image assists in understanding the relationships and influences of the different aspects of SOA when defining a SOA Governance model and the associated policies.

Figure 4-4 SOA Governance Influences



### 4.2.1 SOA Guiding Principles & Policies

The hallmark of an effective set of SOA principles is a clear trail of evidence from the business to the SOA principles. Principles assist in establishing the direction for governance decisions. If principles are not clear it is unlikely that the governance decisions will coalesce meaningfully.



- Ensuring that appropriate projects are selected for the application of SOA techniques and technologies
- Prioritizing projects and aligning them with the SOA strategy and SOA Roadmap (for example, to ensure that projects take into account services that gradually come online as denoted in the business services portfolio plan)

Service Portfolio policies enable better decision making around:

- Categorization and identification of Services
- Evaluation and alignment of Service Candidates
- Service Funding
- Prioritization of approved Service Candidates
- Service ownership
- Service management
- Service versioning

Failure to define policies at the portfolio level leads to redundancy in the development of duplicate Services, lack of harvest/reuse opportunities and no alignment between the Services defined and the business objectives.

### 4.2.3 SOA Governance Processes

During the assessment, root causes should have been identified for any current weaknesses in the current processes that an enterprise utilizes. Current processes that are barriers to SOA success need to be updated or eliminated.

All SOA Governance processes/inspection points should be agile and cater for any appropriate exception processes. All SOA Governance processes/inspection points must have clear accountabilities. It is not good enough to define the inspection points and associated policies if there isn't real ownership of how these policies are monitored and potentially enforced.

Example processes which should be reviewed and enhanced (Update with inspection points) are:

- **Solution and Service Engineering Process** - Defining policies and inspection points that drive consistency in Service design and implementation to ensure that shared Services are architected and deployed in an agreed standardized manner to facilitate and realize sharing and interoperability. In addition defining policies and inspection points that drive consistency in Service usage, Service harvesting and architecture alignment.
- **Service & Solution operational Processes** - Defining policies and inspection points around security, logging, billing, service reliability, and the handling of policy exceptions and violations.
- **Architecture development, alignment and vitality processes** - Defining policies and inspection points in the use of the agreed SOA Reference Architecture and its continuing relevancy.

### 4.2.4 SOA Organization

It is necessary to have workable organizational structures established to control and support all SOA Governance activities. These structures must be empowered to make and when necessary enforce decisions. The structures defined should involve a combination of existing IT and EA governance structures, and capabilities. Each

enterprise will have differing structure requirements that should transcend the organization chart.

Early phases of SOA initiatives tend to be staffed by experienced practitioners in a centrally located SOA COE focusing on defining enterprise standards, achieving early wins and identifying reuse opportunities. Future phases build upon early wins and increase confidence across the enterprise while at the same time extending and optimizing the SOA Governance processes, structures & tools.

SOA Governance structures should be designed to have multiple levels of decision makers and the appropriate conflict resolution processes. But it is imperative within an SOA initiative that these decisions are made in a pragmatic and timely manner. Therefore, decision making should be a collaborative process that can be delegated and federated.

Longer term larger enterprises will need federated governance structures where each domain (i.e. LOB) has the authority to make decisions. More sophisticated federated SOA Governance models will dictate exactly which policies can be overridden rather than having the authority over all policies.

Apart from defining the required SOA organizational structures, governance policies should be defined that encourage the desirable behavior among stakeholders.

#### **4.2.5 Funding Model**

It should be understood that governance is greatly influenced by the funding models that an enterprise currently has in place. Therefore an enterprise must be open to reviewing and potentially revising their current funding model.

SOA investment should not be wholly in the hands of IT professionals because IT investment decisions involve business tradeoffs and SOA projects compete for funds with other non-SOA projects.

#### **4.2.6 SOA Governance Infrastructure**

While technology alone cannot address all of an enterprise's SOA Governance needs, it can help to automate the associated governance processes and policies and increase adoption. Enterprises should focus on governance technology that focuses on all the different elements involved within the SOA initiative and are well integrated so there is as much automation as possible with as little disruption to those SOA assets being governed.

The SOA Governance infrastructure is part of the overall SOA infrastructure which needs to have policies defined regarding the identification, sourcing, and management just like any other component of SOA. It is not a one-time "fire-and-forget" decision. Hence, policies need to be enacted to ensure that technical solutions adhere to industry and enterprise standards.

The SOA infrastructure areas to focus on are:

- SOA Asset Management
- Policy Management and Enforcement
- Consumer Management
- SOA Monitoring and Management

#### 4.2.6.1 SOA Asset Management

It is through SOA asset management, the collection of services and supporting assets, that an enterprise can ensure alignment with their architecture.

SOA Asset Management must:

- Provide the means to centrally manage the metadata for any type of software asset, from business processes and Web services to patterns, frameworks, applications, and components
- Map the relationships and interdependencies that connect software assets to the SOA, and the SOA to business objectives
- Support project planning, impact analysis, investment decisions, collaboration, and reuse by providing stakeholders with visibility and traceability of Services and their supporting artifacts
- Provide the means to apply governance policies to assets and to systematize reuse of those assets
- Include tools and metrics to measure and communicate both compliance with governance policies and the ROI of the SOA transformation effort

#### 4.2.6.2 Policy Management and Enforcement

Policy management and enforcement measures are essential for effective SOA governance. These measures must:

- Centralize management of policy artifacts for versioning and change control
- Support distributed enforcement across the infrastructure
- Enable continuous design time policy validation
- Ensure policy compliance throughout the lifecycle
- Enable direct control over the SOA lifecycle

#### 4.2.6.3 Consumer Management

Consumer management supports the creation and enforcement of usage agreements between Service consumers and providers. It is essential in preserving and sustaining agility and alignment with architectural standards and business objectives. Service consumer management technologies must

- Provide structured workflow for consumer/provider contracts
- Enable policy-based terms of usage
- Automate enforcement of contracts via SLA and security policies
- Provide the foundation for a shared Services model

#### 4.2.6.4 SOA Monitoring and Management

Effective SOA lifecycle governance requires proper SOA management and enforcement to ensure that constituent components operate as intended, within design parameters. This is critical for visibility into policy compliance and QoS metrics. Such visibility, in turn, enables the SOA to continuously evolve and mature.

SOA monitoring and management must:

- Centralize management of distributed, heterogeneous SOA
- Provide end-to-end visibility into service networks

- Track enforcement of service contracts and QoS
- Support decision-making with metrics and analytics

#### 4.2.6.5 Oracle Enabling Technologies

Key enabling technologies in Oracle's SOA Governance solution include the following Oracle products and services:

- **Oracle Enterprise Repository and Oracle Service Registry** - Combines a comprehensive enterprise metadata repository with a Universal Description, Discovery, and Integration-compliant Service registry to bridge the entire Service lifecycle, providing visibility, traceability, and governance of the enterprise Service and asset portfolio to ensure business and architectural alignment and measurable ROI.
- **Oracle Web Services Manager** - Manages, enforces, and tracks policies applied to SOA for automation of governance across the lifecycle, while providing a foundation for shared Services through consumer/provider contract management.
- **Oracle Enterprise Management Pack for SOA** - Manages the health and well-being of the SOA to ensure QoS, while providing operational visibility and control.

In addition to Oracle's SOA Governance products a number of other Oracle products can be utilized to add further value. An example of these products are:

- **Oracle Business Process Management** - Contains a complete set of tools in enabling collaboration between business and IT to create, automate, execute, and optimize business processes. The Oracle Business Process management solution can be utilized to automate complex SOA Governance processes.

### 4.2.7 Metrics

To enable the monitoring of the SOA environment it is important that appropriate metrics are defined. Not only can metrics indicate how well the SOA Governance model is performing, they can also serve to clarify the vague terms used in SOA vision statements. Without metrics, there can be confusion about whether goals are being met and return on investment achieved.

It is imperative that a manageable set of metrics are defined and that each metric has a clearly defined rationale. Too many metrics can be overwhelming so enterprises should choose metrics that can be measured with confidence. Initial metrics are likely to be very simple and almost anecdotal. As the adoption and maturity of an enterprises SOA initiative increases, so do the metrics.

Example metrics types include an indicator (i.e. Customer Satisfaction), a driver (i.e. Quality), and a measure (i.e. Number of defects). It takes a combination of business metrics, process metrics, performance and SLA metrics, conformance metrics, and reuse metrics in order to really monitor and evolve the behaviors of an SOA.

If reuse is a goal of an enterprise SOA initiative then "Savings through the reuse of Services" is a key metric, because it represents development costs avoided and a reduction in system complexity. (See *Measuring SOA Success - Key Metrics for Determining the ROI of SOA Through Reuse* document) Or an enterprise might set a goal to build a certain number of Services to achieve progress on the roadmap, supported by a metric measuring the number of new Services delivered per quarter. Many enterprises have found that it helps to provide a scoreboard to fuel momentum,

demonstrate commitment to programs, and provide recognition of progress among stakeholders.

### 4.3 Deploy and Execute

Each iteration of the SOA Governance roadmap focuses around the deployment and execution of the defined governance mechanisms. This includes how to obtain and evaluate metrics, how to enforce policies and procedures, rollout of new organization structures, associated training and the supporting governance infrastructure.

Some governance processes may be automated, such as using tools to make sure that WSDLs for services are WS-I compliant. The more governance processes that can be automated, the easier it is to scale enterprise-wide SOA efforts. Some governance processes have to be manual, but must be employed to ensure that everyone is moving in the same direction.

At deployment, assets and their associated policies are published to the various runtime infrastructure elements that manage and enforce the runtime behavior of those artifacts.

### 4.4 Manage and Monitor

SOA Management and Monitoring is critical to ensuring that the various elements of the enterprise's SOA ecosystem are operating in good health and within compliance of service level agreements. The information (metrics later used for analysis and decision support) is collected within the SOA ecosystem, such as runtime containers that can publish the appropriate metrics back into the repository for traceability along with the artifacts. This creates a single source of truth, where users can go to fully understand everything they need to know regarding an asset.

While enterprises routinely monitor their operational environment, it is important to monitor the non- operational aspects of your SOA such as SOA Business Value, SOA Maturity and SOA Engineering. The use of technology across all aspects of monitoring is key to provide/assist with this visibility requirement.

Collected metrics should be communicated to the business and IT stakeholders allow them the opportunity to analyze and evaluate.

### 4.5 Analyze and Evaluate

Early incarnations of the SOA Governance model are built upon assumptions. This is especially true when focusing on change management issues. Therefore the Analyze & Evaluate activities can be seen as closing the improvement loop for updating and refining the SOA Governance model and the associated roadmap.

The defined governance KPI's/metrics must be analyzed and compared to the enterprise's SOA goals and roadmap. This allows the enterprise to optimize both the deployed SOA Governance capabilities but also the capabilities planned for the next deployment phase. It should be noted that not all metrics are equally important and any decision taken should not be based on a single metric but on a set of related metrics.

Enterprises should analyze the results of the SOA governance policies and metrics (i.e. Conformance reporting and policy breaches) that have been put in place, including their effectiveness. Enterprises should also measure the progress that has been made on the SOA Roadmap, relaxing overly restrictive policies where it makes sense and

taking corrective action where necessary. A lot of companies separate "policies" (have to follow) from "guidelines" (should follow).

Lastly the vitality needs of assets such as the SOA reference architecture, SOA roadmap, etc. are analyzed

---

---

## Summary

Whether an enterprise's SOA has 50 Services being used by one consumer, or 50 consumers using one Service, an enterprise requires SOA Governance. Increased business agility depends on it. SOA Governance provides the ability to quickly and continuously translate and transmit business strategy and requirements into the services, processes, policies, and controls that will guide the evolution of your SOA infrastructure and your enterprise.

Failure to provide effective SOA Governance exposes your enterprise to serious risks resulting from:

- Insufficient adoption of Services
- Fragmented approaches to SOA
- Resources wasted on Services that can't be reused
- Rampant and redundant Service creation across silo-ed SOA initiatives
- Ineffective communication of priorities and best practices
- Cultural resistance to change

Enterprises must focus at the broader facets of governance not just the Services lifecycle. SOA Governance is more than governing Services; it is about governing all SOA assets and gaining the maximum value from all SOA activities. There is no "one size fits all" when it comes to defining a SOA Governance model, but there are a number of best practices and patterns that can be used to expedite and streamline an approach to define a pragmatic and customized SOA Governance model.

Any SOA Governance model built must support the overall SOA initiative and associated SOA roadmap. Therefore the SOA Governance model must not be deployed in a "big bang" approach but rather over a 2-3 year period where near-term initiatives are defined by realistic goals and objectives.

SOA Governance is not a one-off project, but must be seen as an on-going process that requires monitoring, where progress is measured and required course correction are applied. While initially a SOA Governance models tends to be centralized, it will have to be updated and expanded to a more federated model as the SOA initiative matures, so that large enterprises are able to react in a timely manner.

Contrary to initial thoughts, technology alone can not solve the governance requirements of SOA and requires equal focus on technology, process and people. Culture change is a key tenet of SOA Governance and the appropriate level of focus and commitment must be addressed from the very beginning

Successful SOA Governance starts from the top to drive its adoption and commitment.



---

---

## Key Concepts

As a discipline, governance has been with us for many years, but with the advent of Enterprise SOA the need has been heightened for enterprises to take governance as a discipline more seriously. This appendix describe several existing forms of governance to give some context.

### A.1 Governance

There are many definitions of governance but the following definition is invaluable as a point of reference.

---

---

**Governance:** *"A framework for the management of existing and future key assets to extract the best business value for your enterprise"*

---

---

- **Framework** - A governance framework is a set of principles, processes, structures, standards, best practices, policies and tools that assists in defining an appropriate governance model that enables an enterprise to meet its stated goals in accordance to industry, marketplace and internal policies. These governance processes and policies affect the way stakeholders are directed, administered or controlled.
- **Decision Making** - A governance framework specifies the distribution of rights and responsibilities among the different stakeholders, and defines the rules and procedures for making decisions. Two aspects that are key in decision making
  1. Management empowering the relevant mandated stakeholders to make informed decisions and to act accordingly, and
  2. Access to timely and accurate information on which to make these decisions.
- **Asset Management** - A key objective of governance is the harvesting and management of key assets owned by an organization in order to promote, and enforce their use, and deliver qualitative/quantitative business value for an enterprise. Assets are elements that an enterprise has developed, acquired or leased that support the enterprises business goals. These key assets are required to be managed to make sure they continue to deliver on their investments.
- **Compliance** - Governance establishes and administers policies in an environment to influence and enforce actions and behavior that align with business needs.

There are various existing governance disciplines utilized by enterprises today, either formally or informally. Even though the high-level structures of these governance disciplines are similar, the key assets, processes and policies vary considerably.

Even though there are many forms of governance that could have been described, the following governance disciplines give a good basic grounding to later understand the relationships that SOA Governance has with these disciplines.

- Corporate Governance
- IT Governance
- Enterprise Architecture

### A.1.1 Corporate Governance

Corporate governance is the set of processes, customs, policies, and laws affecting the way in which a corporation is directed, administered or controlled. Even though corporate governance is a complex and multi-faceted discipline, the primary focus is around the enterprises' fiduciary responsibility to the shareholders.

---

---

**OECD Corporate Governance:** *"Governance is the system by which business corporations are directed and controlled. The corporate governance structure specifies the distribution of rights and responsibilities among different participants in the corporation, such as, the board, managers, shareholders and other stakeholders, and spells out the rules and procedures for making decisions on corporate affairs. By doing this, it also provides the structure through which the company objectives are set, and the means of attaining those objectives and monitoring performance"*

---

---

This definition of corporate governance by the **OECD (Organization for Economic Co-operation and Development)** highlights a number of key aspects that are critical to a governance discipline.

- **Structure / Rights & Responsibilities** - Organization structures are required to define the appropriate roles and responsibilities, with the appropriate level of authority to execute on their governance mandate.
- **Procedures / Rules** - Defined principles, rules and policies, describe the direction and level of governance adherence.
- **Objectives / Monitoring** - A key aspect of governance is to monitor progress and correct one's course if required to make sure that an enterprise is meeting its goals and objectives.

As previously stated, governance is a framework for the management of existing and future key assets to extract the best business value for an enterprise. When it comes to corporate governance the types of assets that need to be governed are monetary, intellectual property, human capital, etc. Even though corporate governance has a strong focus around regulatory responsibility (i.e. Sarbanes-Oxley, HIPAA), there is just as strong a focus on internally developed policies as well.

Every employee is exposed to corporate governance, most without being aware. Take for example a simple expense reimbursement process. This process is basically a governance process which makes sure that the enterprise's money is wisely spent on approved activities or goods. Various polices have been pre-defined that dictate the amount that is allowed by expense type and how much your manager is allowed to approve.

Even though corporate governance is the most mature governance discipline it is still not infallible as collapses of large enterprises have demonstrated.

## A.1.2 IT Governance

Effective IT governance helps ensure that IT aligns and supports the business goals, optimizes business investment in IT, and appropriately manages IT-related risks, resources and opportunities.

---



---

**IT Governance Institute's - IT Governance Definition:** *“IT governance is the responsibility of the board of directors and executive management. It is an integral part of enterprise governance and consists of the leadership and organizational structures and processes that ensure that the organization's IT sustains and extends the organization's strategies and objectives”*

---



---

- **Assets** - Example IT Governance assets are hardware, software, projects, and relationships. It is common for enterprises to standardize on specific vendors and models for hardware and software to streamline and control expenditure.
- **Processes & Policies** - Example IT governance processes govern decision making around investment decisions, client relationships, project management and other important IT operational areas.

Historically IT departments have lacked the understanding of what IT governance can offer or did not see the need for it. But nowadays it is common to find structures such as IT Steering Committees and **Portfolio Management Offices (PMO)** to make sure that projects are approved, prioritized and that the proposed architecture is in alignment with internally approved standards.

The most common form of IT governance is proprietary internally developed processes and policies. These processes and policies often are developed in a reactive manner to address challenges that enterprises encounter. Conversely, commonly used example industry frameworks such as **COBIT (Control Objectives for Information and related Technology)** and **ITIL (Information Technology Infrastructure Library)** provides a set of generally accepted measures, indicators, processes and best practices to assist IT departments in maximizing the benefits derived through the use of IT.

Oracle endorses ITIL and uses it in its products and support processes with customers.

## A.1.3 Enterprise Architecture Governance

Enterprise architecture governance focuses on the control over the creation and monitoring of all architectural components and activities, to ensure the effective introduction, implementation, and evolution of architecture within the organization.

---



---

**Open Group Architecture Governance Definition:** *“Architecture governance is the practice and orientation by which enterprise architectures and other architectures are managed and controlled at an enterprise-wide level”*

---



---

Enterprise architecture governance tends to be more challenging than IT governance as it is easier to identify if someone is using a non-standard PC but it is a lot harder to detect if someone is using a non-standard architecture.

For this reason it is common to see **architecture review boards (ARB)** to oversee architecture design approval and to ensure compliance with internal and external standards and regulatory obligations.

Many enterprises have seen push back to their EA Governance efforts for various reasons.

- Standards have been developed by teams who rightly or wrongly have been classified as not having "real" implementation experience and that standards developed are not easy to implement.
- Apart from criticism of experience it is also common to see EA teams seen as silo organizations that work in isolation.
- Enforcement of standards tends to be executed via project audits and this has led to the perception that project teams are being monitored by the "Architecture Police"

But companies who define and execute enterprise architecture governance successfully experience consistent investment decisions and increased quality of IT solutions.

---

---

## Further Reading

The *IT Strategies From Oracle* series contains a number of documents that offer insight and guidance on many aspects of technology. In particular, the following documents pertaining to SOA Governance may be of interest:

*Software Engineering in an SOA Environment* - Provides an approach for delivering projects within an SOA environment. It identifies the unique software engineering challenges faced by enterprises adopting SOA and provides a framework to remove the hurdles and improve the efficiency of the SOA initiative.

*Measuring SOA Success - Key Metrics for Determining the ROI of SOA through Reuse* - Provides an approach for estimating the value of the various software assets contained in a typical SOA portfolio. This approach can assist in building the business case for, and determining the impact of Service-Oriented Architecture.

Refer to the *ORA Glossary* document for descriptions of key terms.

In addition, the following materials and sources of information relevant to SOA Governance may be useful:

<http://www.oracle.com/technologies/soa/soa-governance.html> - Oracle's SOA Governance home page.

