An Oracle White Paper in Enterprise Architecture
September 2009

Maximizing SOA Returns with Enterprise Architecture

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Executive Overview

- The value of Service Oriented Architectures has been limited due to its implementation as more of a solution architecture than an enterprise architecture.
- A shared services infrastructure built with the foundation of enterprise architecture can provide sustainable cost reduction.
- Services infrastructure provides the basic technologies, building blocks, and processes necessary to make SOA work effectively in an organization.
- To achieve the maximum value of SOA and reduce cost in an organization, a shared service services model where services are rationalized using an enterprise architecture should be utilized.

SOA + Enterprise Architecture = Cost Savings

Introduction

Over the last few years, Service Oriented Architectures have evolved from the latest technology fad to a well established architecture model for organizations. Service Oriented Architectures offer many advantages including cost reduction through shared services, agility through dynamic orchestration of services, and improved interoperability between application silos.

The evolution of tools for implementing SOA has dramatically simplified the creation and management of services in an organization. While this has reduced the barriers for implementing services and improved integration between applications, many organizations have not been able to realize the value of a shared services infrastructure that promotes service re-use.

The lack of an enterprise view for services has limited the returns for SOA. For many, application silos have been replaced with service silos with each application development team and/or each LOB developing its own set of services. This has resulted in a "services sprawl" where the economies associated with service re-use are not realized.

There are many pressures that promote this phenomenon. Strong separations between lines of business promote the isolation of service implementations. Highly decentralized organizations, especially those with international scope, tend to promote application and service silos.

For many organizations, regulatory or legal separation may be required for certain information requiring a formal separation of services. Organizations that are highly regulated, public, and/ or have international presence may require strict separation of service implementations.

Lack of standardization between service infrastructures can result in service silos. Lack of common service standards, a common service repository, and independent service directories limit reuse of services.

To overcome these challenges and to maximize the returns of SOA in an organization, an enterprise view of services combined with a shared services infrastructure needs to be implemented.

The Role of Enterprise Architecture

Enterprise Architecture (EA) is a method and an organizing principle that aligns functional business objectives and strategies with an IT strategy and execution plan. The enterprise architecture provides a guide to direct the evolution and transformation of enterprises with technology. This in turn makes IT a more strategic asset for successfully implementing a modern business strategy.

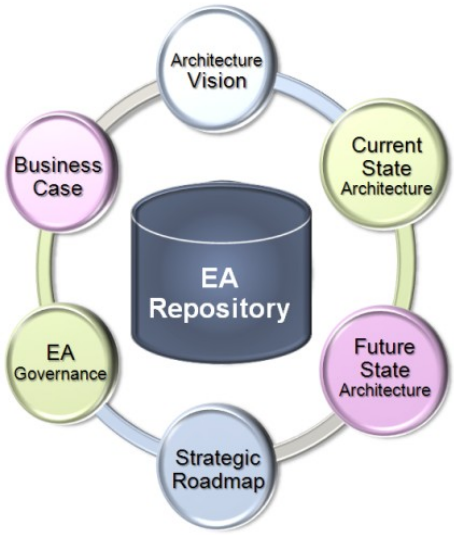
By taking an enterprise wide perspective across business services, business processes, information, applications, and technology, an enterprise architecture ensures the enterprise goals and objectives are addressed in a holistic way across all IT projects.

This enterprise wide view is critical in identifying shared services opportunities throughout the organization. Common business patterns are identified during the development of enterprise architecture. These patterns become prime candidates for shared services in the organization. The enterprise architecture can then provide a roadmap for implementing these shared services.

To be successful, an Enterprise Architecture needs to be woven into the enterprise's culture, not treated as a closed-scope project. The value of an enterprise architecture is greatly enhanced when it is organically embedded into the lifecycle of the organization, including capital planning, project management, asset management, resource allocation, and strategy formulation.

Leveraging Enterprise Architecture with SOA

Oracle has created a streamlined process to facilitate the development of an architecture called the Oracle Application Development Process (OADP).



The OADP divides the development of architecture into the steps of Architecture Vision, Current State Architecture, Future State Architecture, Strategic Roadmap, EA Governance, and Business Case. To streamline the development process, Oracle's approach enables many of these phases to be run concurrently to reduce the time associated with creating an enterprise architecture.
In addition, the OADP encourages a highly iterative approach that facilitates the refining of an architecture based on feedback from previous iterations.

Utilizing this architecture development process provides the structure for creating an enterprise architecture that can optimize the use of shared services in an organization.

Current State Architecture: Rationalizing Services

The first step in facilitating shared services is to rationalize the services in the current state architecture. Rationalization streamlines an existing portfolio of services with the goal of lowering total cost of ownership by:

- **Standardizing** on a common set of services
- **Consolidating** services that achieve similar business functionality
- **Optimizing** services to leverage re-use and achieve the highest performance
- **Eliminating** duplicate and inefficient services

Rationalizing must balance individual business unit, legal and regulatory needs for separation with the economies of scale achieved by a shared-services model.

Rationalization begins with the initial step of collecting an inventory of the current services with associated business capabilities, dependencies, interfaces, SLAs, and security domains.

Use of an Enterprise Repository is the most effective means of collecting and maintaining a centralized source this information. Information from each service registry and the associated documentation for each service should be centralized in an Enterprise Repository to provide a global view of the available services. This enables architects and developers to identify possible re-use of existing services prior to implementing a new service.

Next, potential duplicate services are identified and evaluated based on strategic value, functional fit, conformance to IT standards, risk and cost of ownership.

The most effective means of categorizing services is to group services by business functionality prior to evaluating the technical characteristics of those services. Duplicate business services can then be evaluated for potential consolidation. The use of a value-effort-risk scorecard can assist in classifying duplicate services.

Based on the inventory of existing duplicate services, a set of new standardized services can be identified. These services may be new services that merge the functional requirements of existing services or the identification of an existing service that meets the requirements for other duplicate services.

This rationalization process identifies services that can be consolidated in the future state architecture and implemented through a shared services infrastructure.

Future State Architecture: Building a Shared Services Infrastructure

Unfortunately, simply identifying potential shared services and creating new standards isn't enough to meet the requirements for shared services in an organization.

Most organizations have organizational, legal and regulatory requirements that may prohibit a purely centralized services structure. Services may need to be distributed between business units, geographic boundaries and/or security zones in an organization.

To facilitate the standardization of services in an organization and yet meet the decentralized requirements for implementation, a shared services infrastructure should be implemented. A services infrastructure represents the standards, principles, processes, technologies, and building blocks to facilitate a Service Oriented Architecture in an organization. A shared services infrastructure builds on this concept to enabled shared services to be implemented even when business requirements necessitate formal barriers inside an organization.

Service Infrastructure Principles

A services infrastructure starts with a core set of guiding principles for the implementation of services in an organization. Examples of these principles include:

- Clear and distinct separation between the way we access data and the way we process data.
- Business Services drive the need for data access services
- Data is owned by the enterprise
- Data services must not expose behavior (business logic)
- Business services must access data via data services
- Services should employ a common security mechanism.
- The service level objectives of the Business should drive those of the underlying Technology.
- Services adhere to a contractual agreement, as defined collectively by one or more Service description documents. Facilities for monitoring compliance must be implemented.
- Services should be designed for re-use
- Separation required for LOB or regulatory requirements should leverage

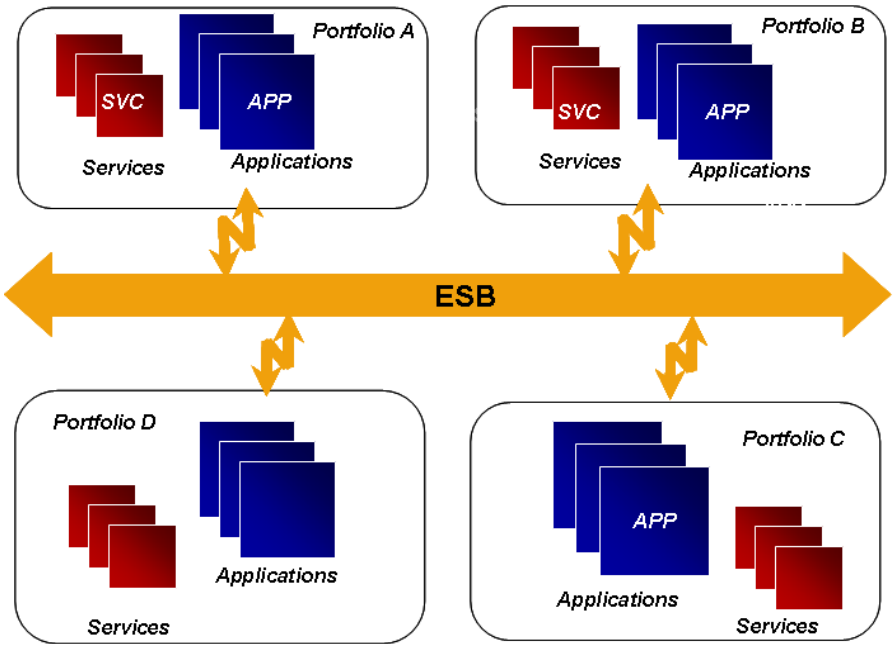
The principles for a services infrastructure should be enforced consistently throughout the organization and provide a starting point for sharing of services.

Shared Service Infrastructure Patterns

One common misconception is that a shared services infrastructure must be implemented through a centralized model. Standardization and centralization are not synonymous – standardization can occur with replication in a decentralized manner as well.

There are three patterns for implementing a shared services infrastructure that meet the requirements for most organizations:

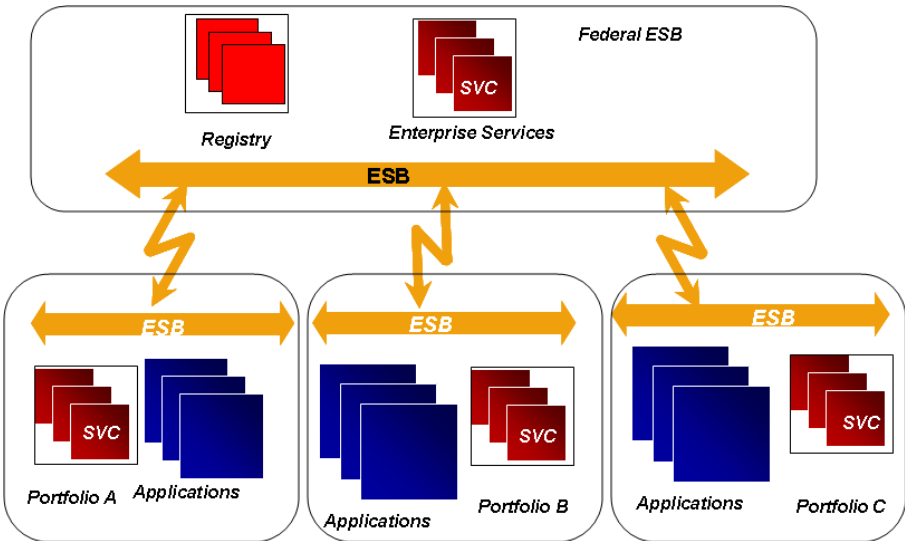
Centralized



In a centralized shared services infrastructure, a common Services Bus is utilized for implementing services throughout the organization. In this model, each application portfolio or line of business shares a common service bus.

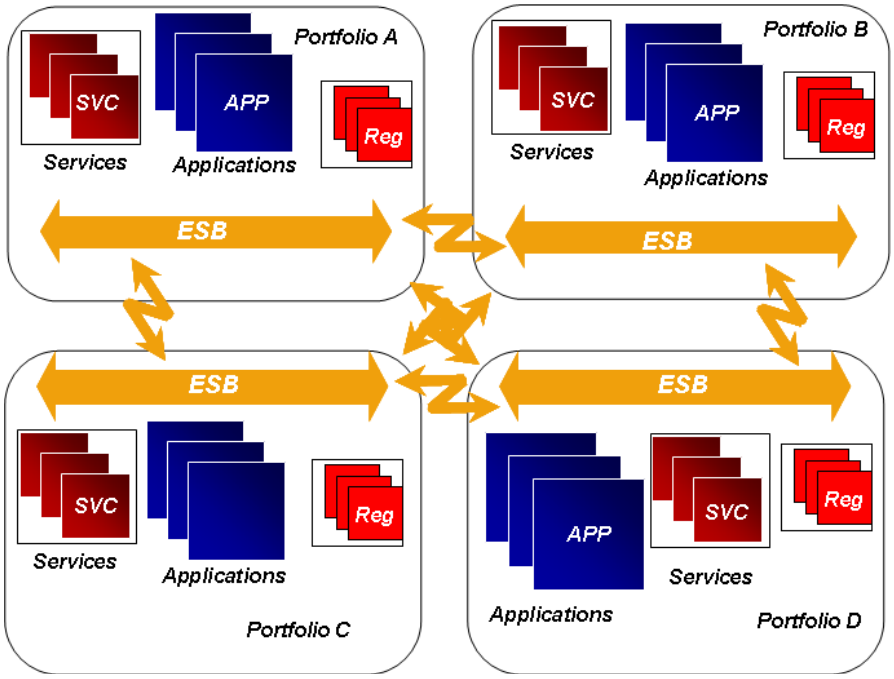
While this is the simplest from integration of services, it does not necessarily meet the needs of highly diverse lines of businesses or organizations that require separation for legal or regulatory reasons.

Federated



In a federated model, a central service bus is used to connect independent service buses in the enterprise. A common centralized registry is used for all services enabling each application portfolio to have visibility into all services in the enterprise. The separation of service buses provides independence for each application portfolio yet enables access to shared resources when appropriate. Common services can be implemented at the Federal ESB allowing the transition from independent to shared services.

Distributed Federated



In a distributed federated model, each application portfolio implements its own independent ESB, services and service registry. Each ESB is then federated with each other through a mesh topology. This allows total autonomy for each application portfolio but enables services to be identified and consumed between portfolios.

Future State Services

With a common set of principles and an infrastructure that facilitates sharing while preserving the required boundaries of your business, a future state services architecture can be designed.

Services in a distributed or distributed federated model that need to be duplicated between portfolios should leverage a common definition maintained the enterprise repository and copied between each environment as needed. A governance policy will then need to be created to manage the maintenance of this service between portfolios.

Developing a Strategic Roadmap

In order to transition to the proposed future state services architecture, a roadmap must be created for transforming each existing service. This will involve consolidating services that achieve similar business functionality and eliminating duplicate and inefficient services.

This may require modifying the service interface to accommodate the requirements of multiple service consumers. To facilitate the transition, wrapper services can be created to adjust for the difference between the current state and future state service design.

Enterprise Architecture Governance

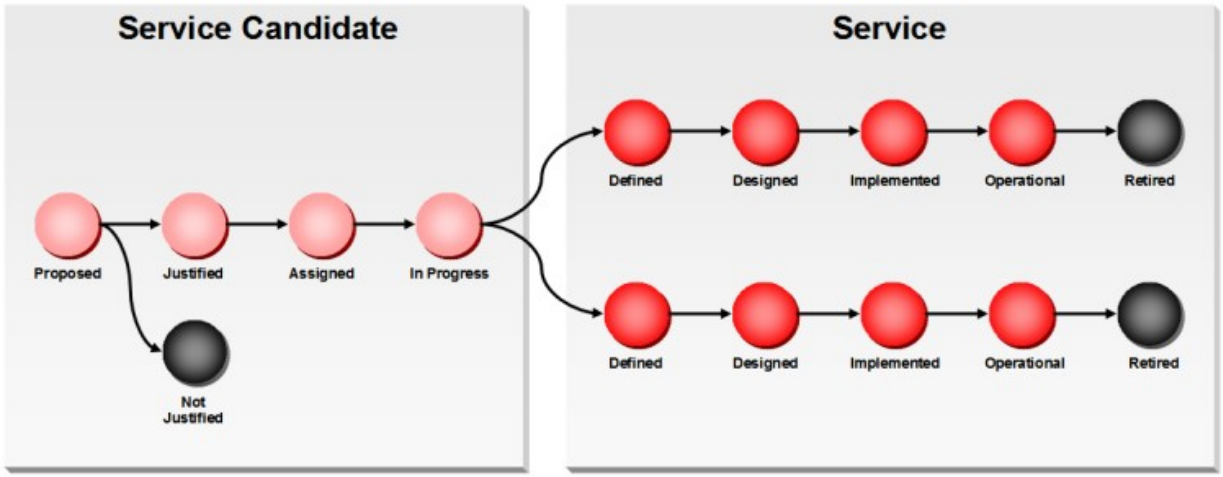
While the prior current and future state architecture process assists in the consolidation of existing services, governance provides the structure to prevent duplication in the future.

Enterprise Architecture governance provides the structure and processes for implementing an organization's businesses strategy and objectives through an enterprise architecture. An EA governance body is used to guide each project and ensure its alignment with the EA during IT transformations and solution implementations. Governance enforces the lifecycle process that can identify shared service opportunities early on to avoid future duplication.

Successful EA governance includes:

- People: Teams, individuals, roles, and responsibilities of the governance board(s)
- Processes, Policies: Architecture lifecycle management, change management, review cycles, etc.
- Technology: Infrastructure for implementing the processes and policies of enterprise architecture governance
- Financial: IT cost allocation, project-funding models, business case tools to continuously monitor a positive return on investment, etc.

For services, a well defined services lifecycle process is essential for governing the creation of new services. The following diagram depicts a typical lifecycle for a service from a proposed candidate to a retired service.



If the enterprise architecture governance board plays a key role during the service candidate phase of a service lifecycle in identifying potential services that can be re-used, future duplication can be avoided.

A well defined EA Governance discipline is vital to effectively sharing services in an organization. Through EA Governance, each IT project and solution architecture is reviewed to ensure that shared services are being utilized where prescribed and identifies opportunities for new shared services. This dramatically reduces "service sprawl" and maximizes the reuse increasing the return for SOA.

Business Case

A critical element of any architecture is the clear articulation of the business case for the future state architecture. Creating a business case starts with collecting the cost associated with the current state architecture. This includes development, maintenance, and infrastructure cost associated with the current state architecture.

Next, the cost associated with the future state architecture must be quantified. This should include any one time cost associated with the roadmap from the current state to the future state.

With the current cost and future cost quantified, a cost/benefit analysis can be performed to show the value of the shared services infrastructure.

Conclusion

By combining Services Oriented Architectures with Enterprise Architectures, an organization can achieve increased value and cost savings through the implementation of a shared services infrastructure. Through the process of rationalizing services, duplicate services are identified and consolidated. EA Governance provides the on-going guidance to ensure that future

applications will leverage shared services wherever possible. This maximizes the cost saving potential of SOA and leverages Enterprise Architecture's improved alignment of the business to IT.

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Author: Robert Covington

Oracle Corporation
World Headquarters
500 Oracle Parkway
Redwood Shores, CA 94065
U.S.A.

Worldwide Inquiries:
Phone: +1.650.506.7000
Fax: +1.650.506.7200
oracle.com

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