

Service-Orientation and Next Generation SOA



Service-Oriented Linguistics

"Service-Orientation"

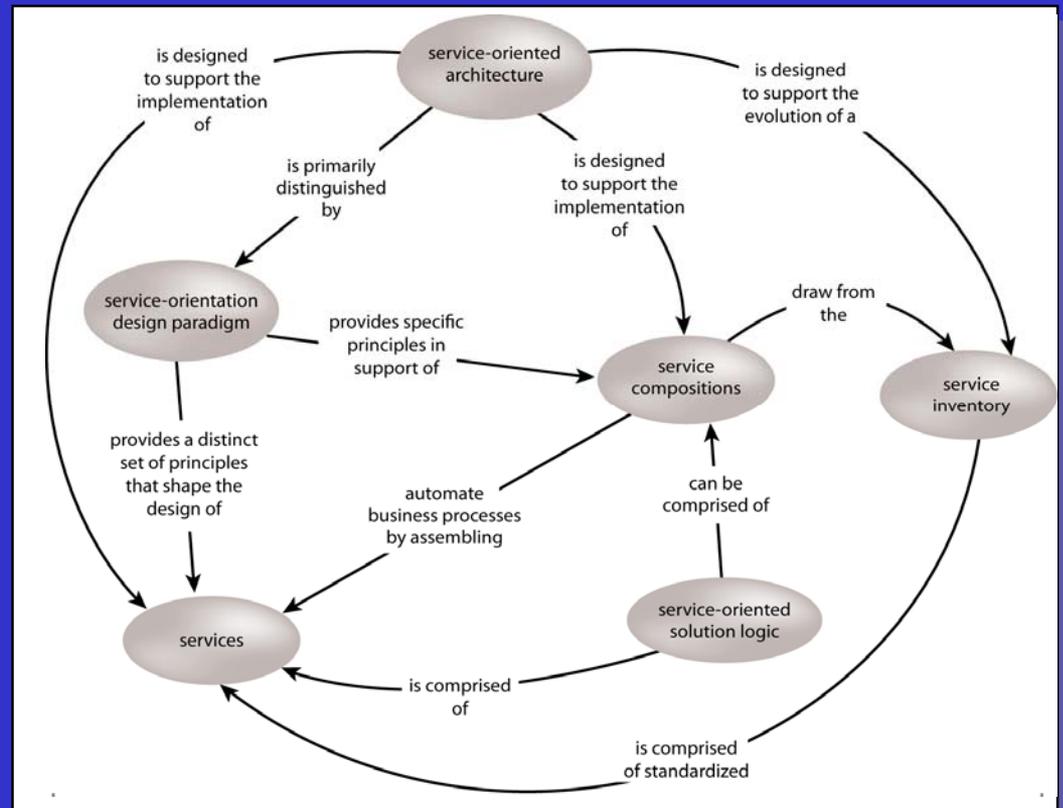
"Service"

"Service Composition"

"Service-Oriented Solution Logic"

"Service Inventory"

"Service-Oriented Computing"





The Two SOAs

S☹A, the Media Acronym ("The Evil Twin")

- historically ambiguous and over-hyped
- was first associated solely with Web services
- was later stigmatized with "big bang" project delivery
- can be ignored

S😊A, the Architectural Model ("The Good Twin")

- a unique form of distributed architecture
- exists to support the realization of service-orientation
- has distinct characteristics, principles, patterns
- cannot be ignored

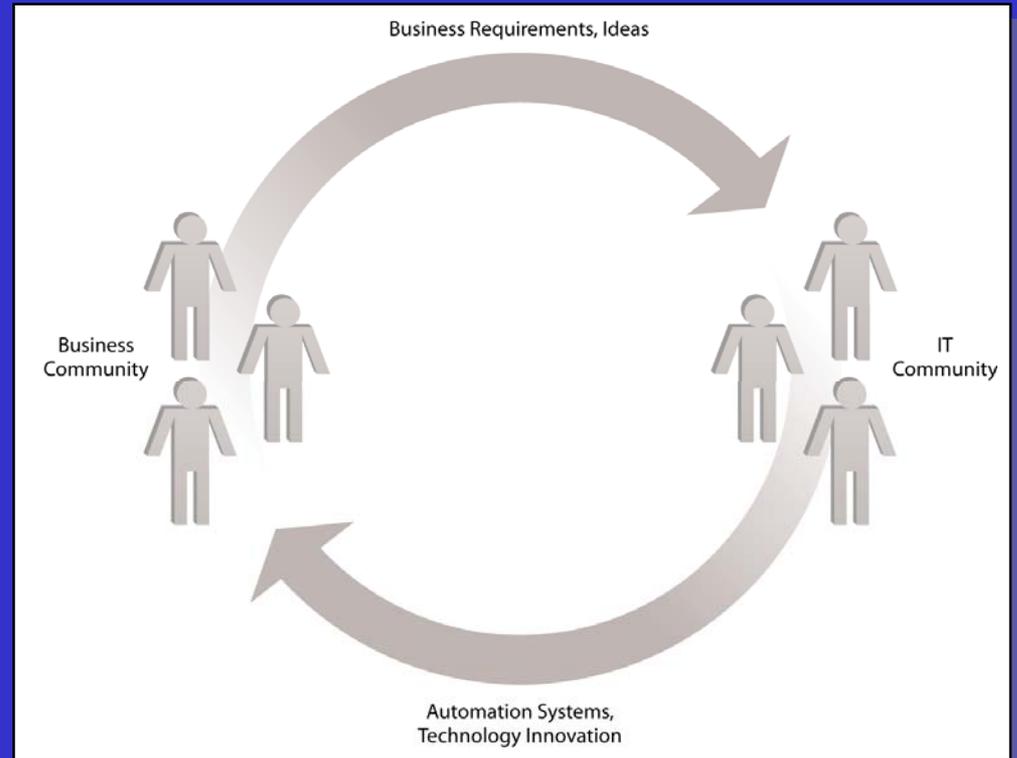
The key is to understand the service-orientation paradigm.



The Endless IT Progress Cycle

Business demands and trends create automation requirements that the IT community strives to fulfill.

New method and technology innovations produced by the IT community help inspire organizations to improve their existing business and even try out new lines of business.





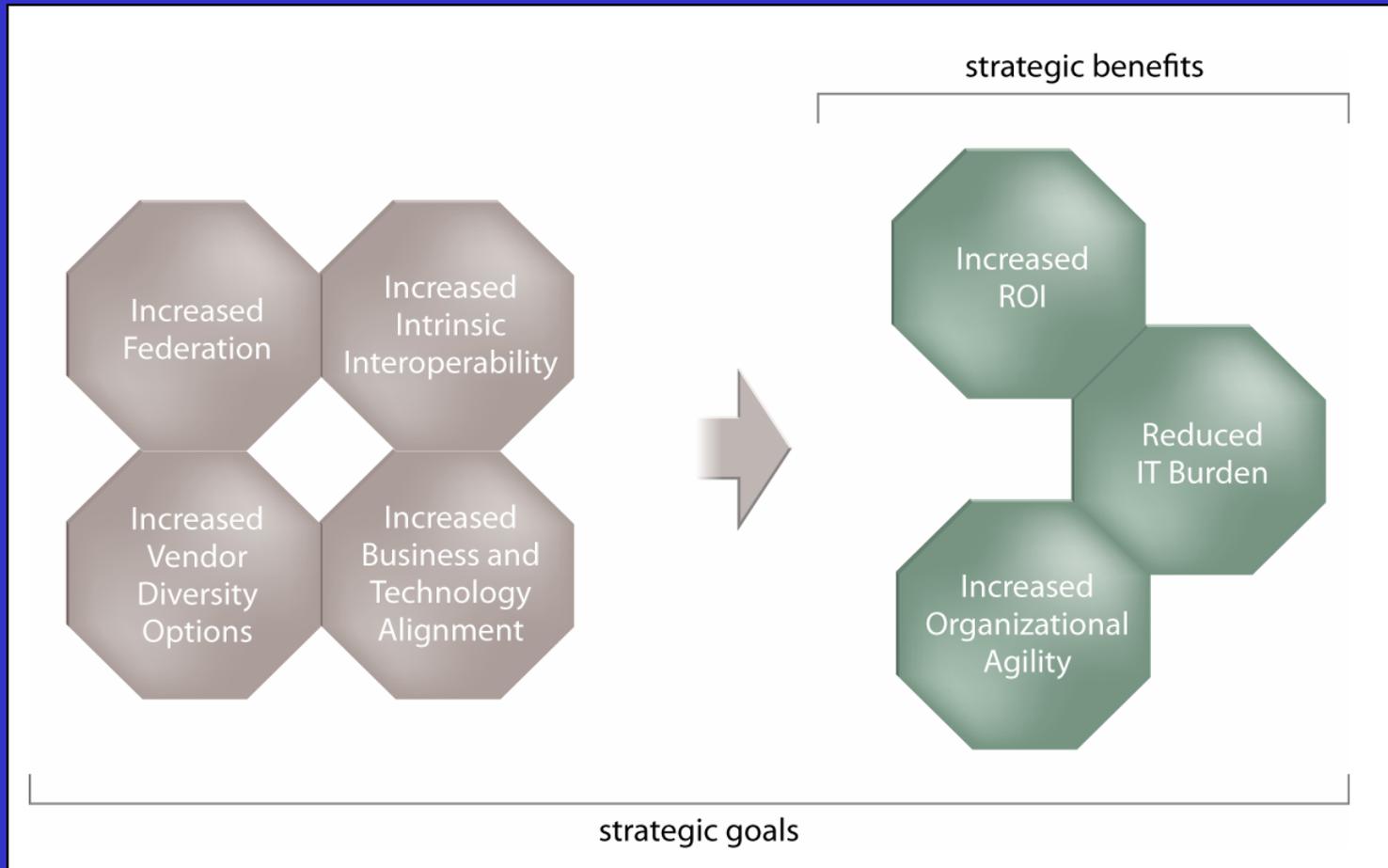
Next Generation Service-Oriented Computing

Next Generation Service-Oriented Computing is comprised of:

- **a vision** that defines a target state
- **a formal paradigm** that defines a method for achieving the target state
- **technology innovation** that improves the benefit potential of the target state
- **technology architecture** capable of realizing the target state
- **formal practices and patterns** that support the creation and evolution of the target state



The Vision: The Strategic Goals of Service-Oriented Computing



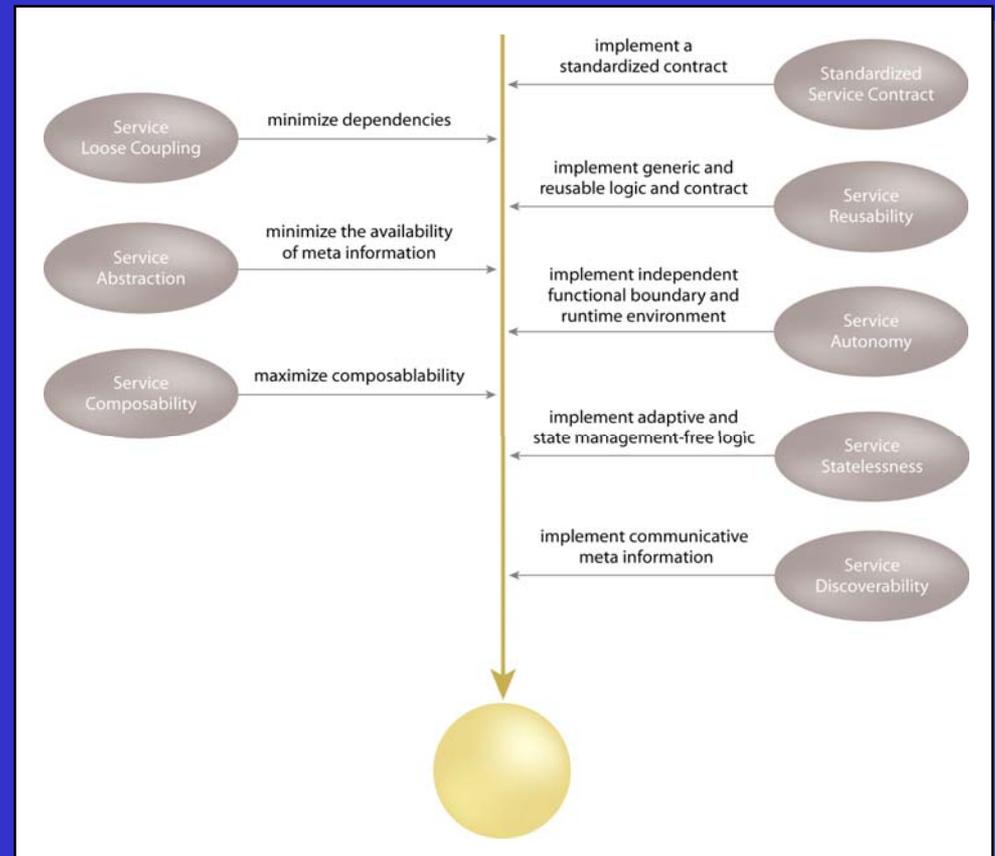
The **first four** goals lead to the attainment of the **latter three** goals and benefits.



The Paradigm: Service-Orientation

The eight service-orientation design principles:

- Standardized Service Contract
- Service Loose Coupling
- Service Abstraction
- Service Reusability
- Service Autonomy
- Service Statelessness
- Service Discoverability
- Service Composability

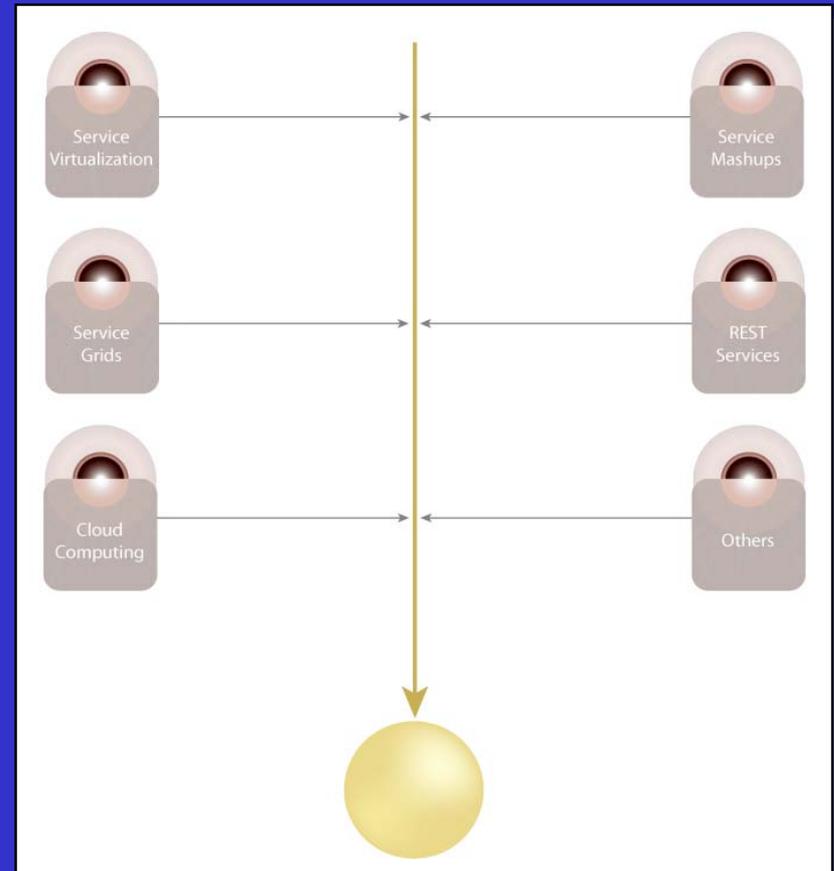




Technology Innovation: Modern Service Technologies

Modern service technologies provide critical solutions to scalability, reliability, performance, usage, and economical constraints that have inhibited some of the past SOA initiatives.

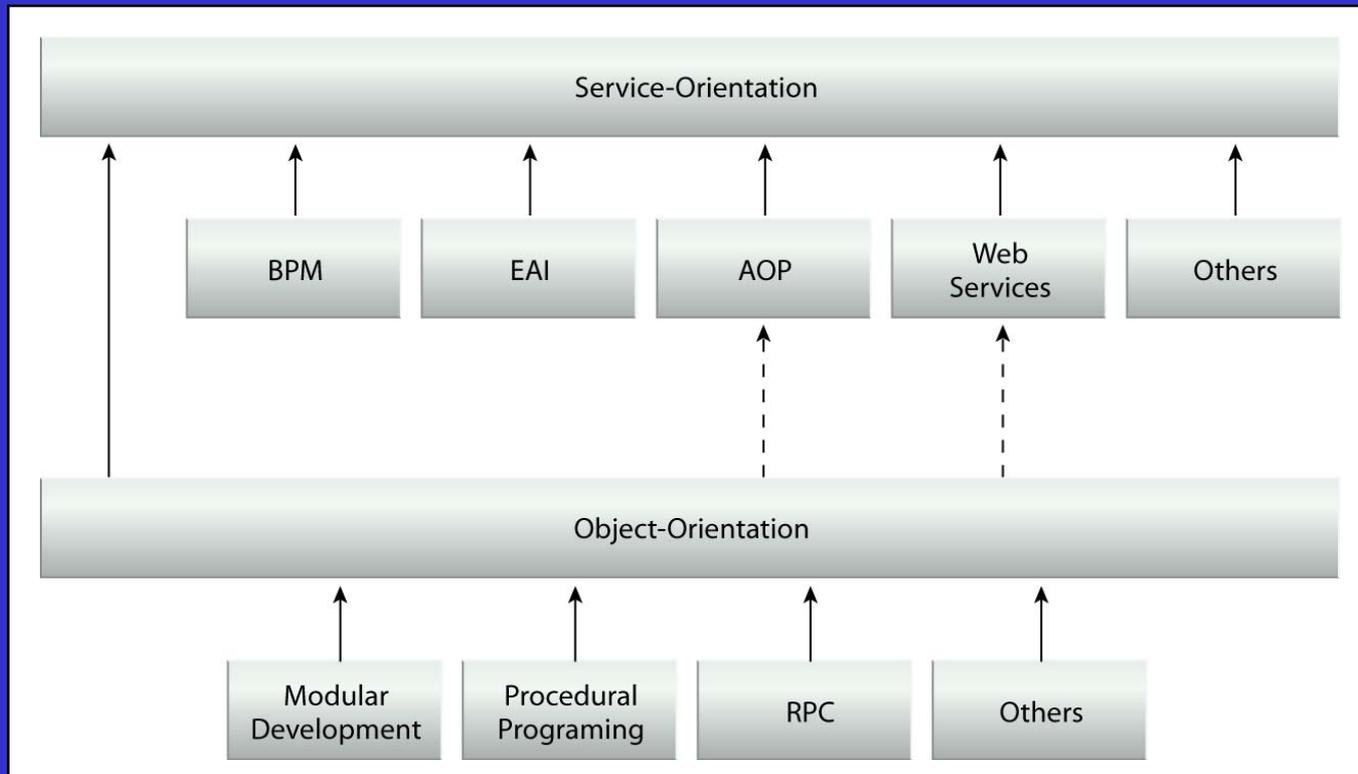
However, several of these technologies are still maturing.





At Look at the Past: The Roots of Service-Orientation

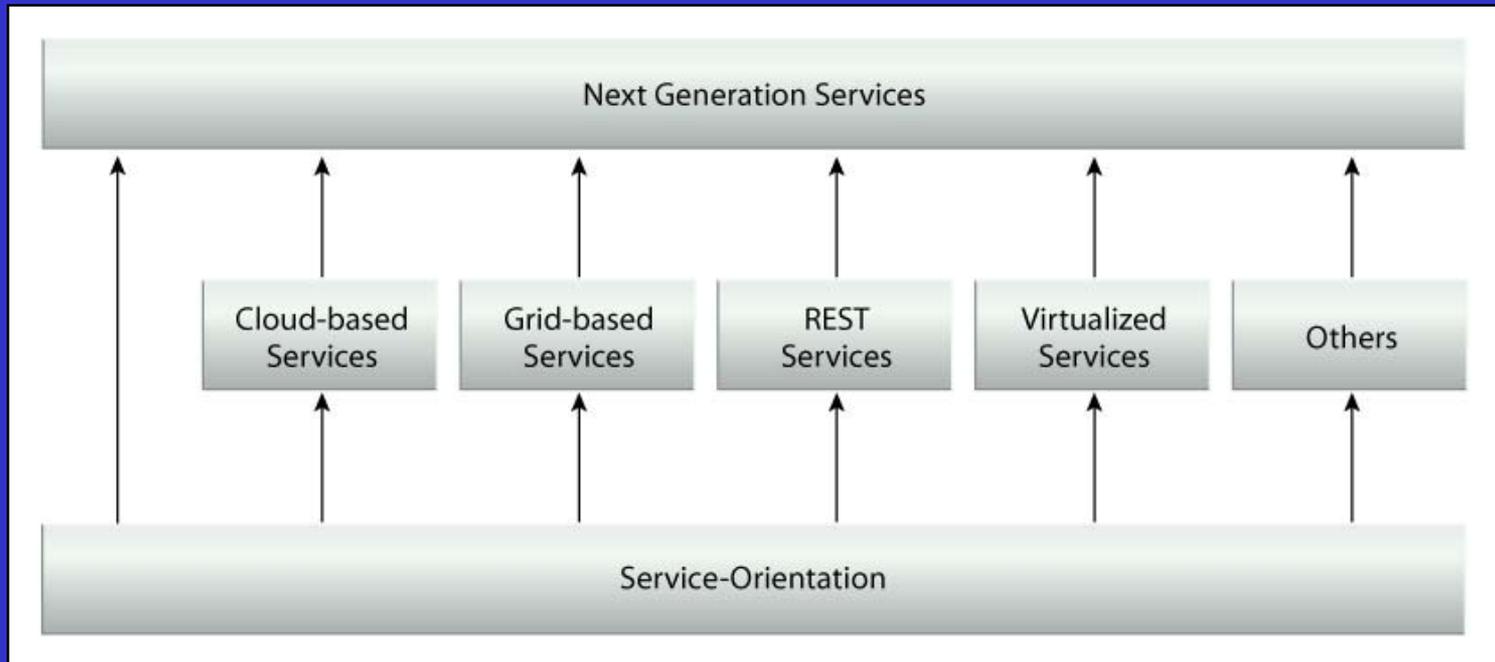
The service-orientation design paradigm has been influenced by several established design platforms and technology innovations.





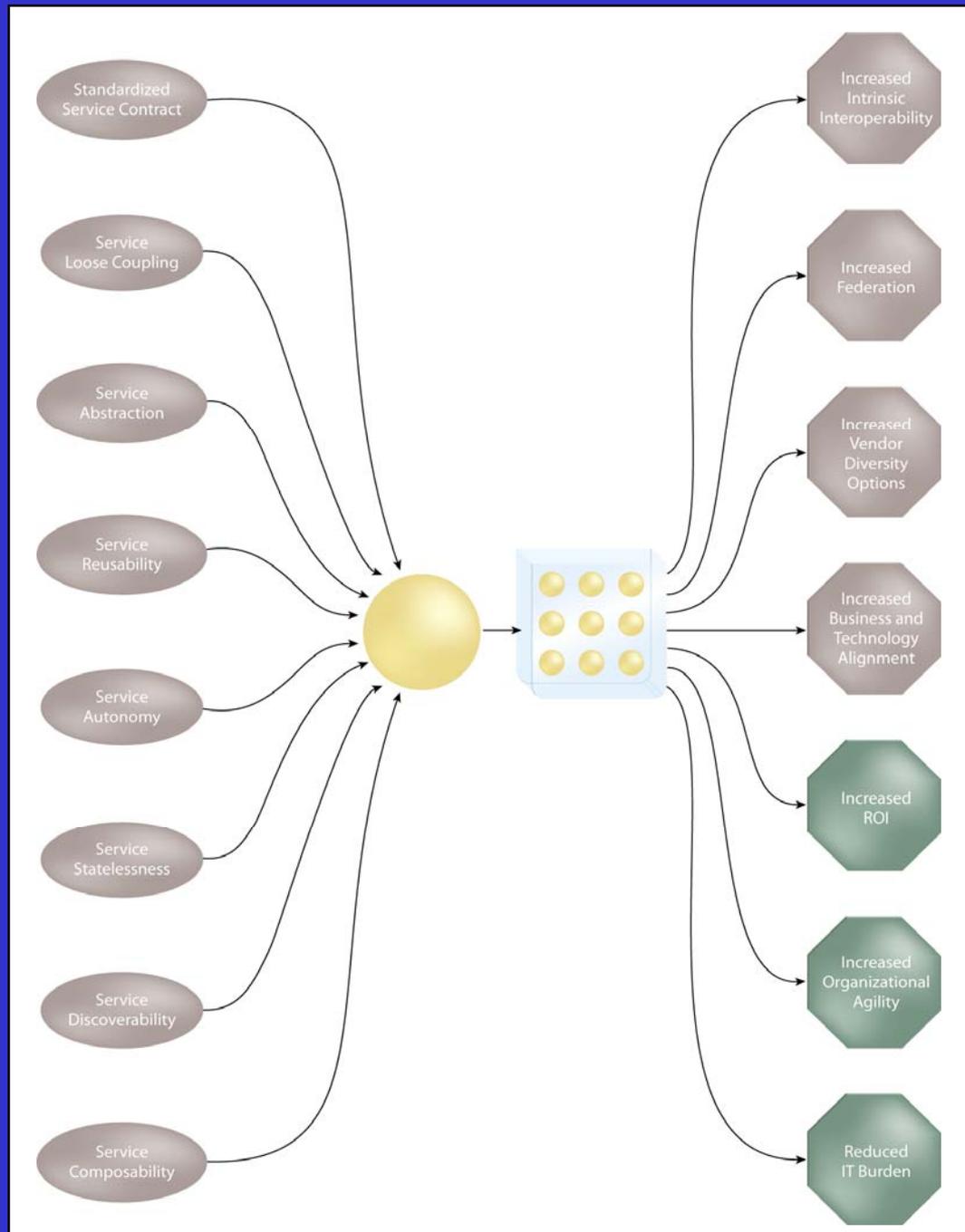
At Look at the Future: The Influence of Service-Orientation

The service-orientation design paradigm helps shape and leverage modern service technologies in support of creating next-generation services.



Service-Orientation and Service-Oriented Computing

As services are shaped by service-orientation, they are added to a service inventory that establishes an environment in support of the goals of service-oriented computing.



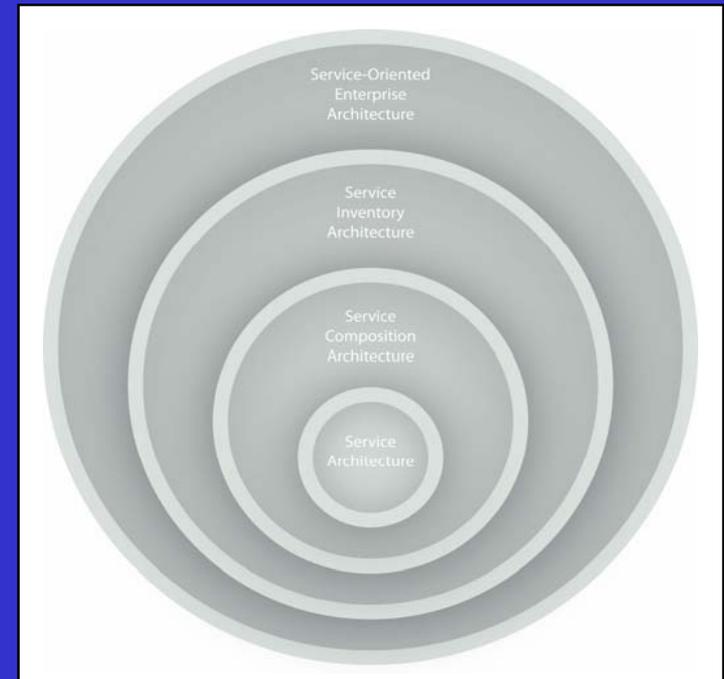


Technology Architecture: Next Generation SOA

Next generation SOA is a distinct technology architecture shaped by the demands and requirements of applying service-orientation for the creation of service-oriented solutions with traditional and modern service technologies in support of the goals of service-oriented computing.

Fundamental characteristics:

- business-driven
- vendor-neutral
- enterprise-centric
- composition-centric



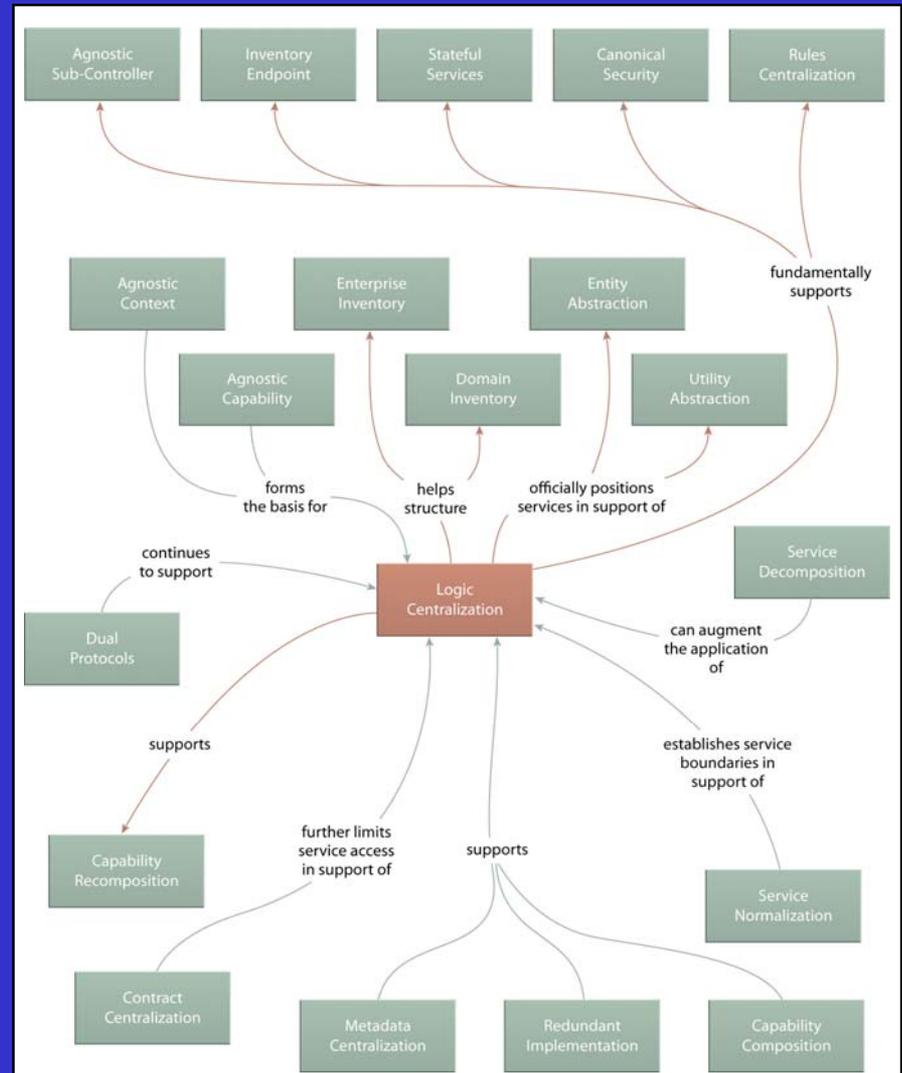


Formal Practices and Patterns: SOA Design Pattern Catalog

The SOA design pattern catalog was the result of a 3 year community effort that involved over 200 IT professionals from the SOA and patterns communities.

Organizations involved include Oracle, Sun, Microsoft, Red Hat, IBM, Intel, Cisco, Booz Allen, HP, SAP, Google, MITRE, DoD, and many others.

More patterns are in development...



Agnostic Capability
Agnostic Context
Agnostic Sub-Controller
Asynchronous Queuing
Atomic Service Transaction
Brokered Authentication
Canonical Expression
Canonical Protocol
Canonical Resources
Canonical Schema
Canonical Schema Bus
Canonical Versioning
Capability Composition
Capability Recomposition
Compatible Change
Compensating Service Transaction
Composition Autonomy
Concurrent Contracts
Contract Centralization
Contract Denormalization
Cross-Domain Utility Layer
Data Confidentiality
Data Format Transformation
Data Model Transformation
Data Origin Authentication
Decomposed Capability
Decoupled Contract
Direct Authentication
Distributed Capability
Domain Inventory
Dual Protocols

Enterprise Inventory
Enterprise Service Bus
Entity Abstraction
Event-Driven Messaging
Exception Shielding
Federated Endpoint Layer
File Gateway
Functional Decomposition
Intermediate Routing
Inventory Endpoint
Legacy Wrapper
Logic Centralization
Message Screening
Messaging Metadata
Metadata Centralization
Multi-Channel Endpoint
Non-Agnostic Context
Official Endpoint
Orchestration
Partial State Deferral
Partial Validation
Process Abstraction
Process Centralization
Policy Centralization
Protocol Bridging
Proxy Capability
Redundant Implementation
Reliable Messaging
Rules Centralization
Schema Centralization
Service Agent

Service Broker
Service Callback
Service Data Replication
Service Decomposition
Service Encapsulation
Service Facade
Service Grid
Service Instance Routing
Service Layers
Service Messaging
Service Normalization
Service Perimeter Guard
Service Refactoring
State Messaging
State Repository
Stateful Services
Termination Notification
Three-Layer Inventory
Trusted Subsystem
UI Mediator
Utility Abstraction
Validation Abstraction
Version Identification

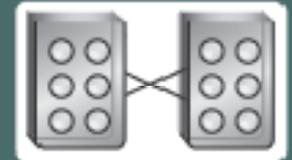
www.soapatterns.com

www.soapatterns.org



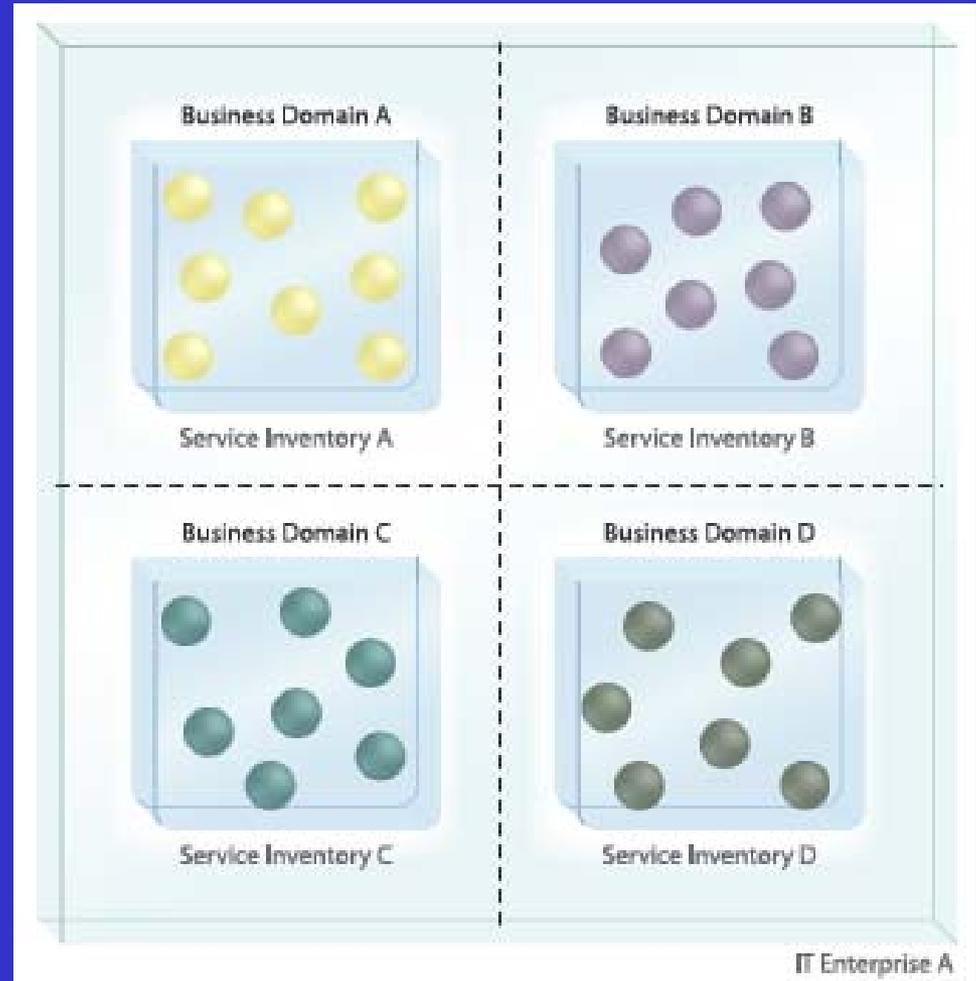
Domain Inventory

How can services be delivered to maximize recomposition when enterprise-wide standardization is not possible?



Problem: Establishing a single enterprise service inventory may be unmanageable for some enterprises, and attempts to do so may jeopardize the success of an SOA adoption as a whole.

Solution: Services can be grouped into manageable, domain-specific service inventories, each of which can be independently standardized, governed, and owned.





SOAPatterns.org / SOADoD.org

SOAPatterns.org is a community site dedicated to the evolution and expansion of the SOA patterns catalog.

SOADoD.org
A Resource Site Dedicated to the Adoption of Service-Oriented Architecture (SOA) within the U.S. Department of Defense (DoD)

Home | News and Resources | Official Documents | Definitions

The Department of Defense (DoD) is perhaps the largest and most complex organization in the world. It manages more than twice the budget of the world's largest corporation, employs more people than the population of a third of the world's countries, provides medical care for as many patients as the largest health management organization, and carries 500 times the number of inventory items as the world's largest commercial retail operation.
- DoD Enterprise Transition Plan, September 2005

Through SOA, the DoD's business IT solutions are being united via an infrastructure and standards-based pattern termed the Business Operating Environment (BOE). As a result, many of the projects and interrelated sub-projects that drive these mission areas are fundamentally based on the development of services through SOA and service-orientation. This site explores documents and resources related to the DoD's SOA initiatives.
- Dennis Winsosky, Chief Architect, BMA, DoD

Business Operating Environment

- Service-Oriented Design Principles
- SOA Design Patterns
- SOA Governance Patterns
- DoD Patterns

BMA Federation Strategy & Roadmap

- Net-Centricity References
- Architecture Federation References
- Business Mission Area References
- DoD Guidance: Policies, Directives & Instructions

SOA Patterns
A Community Site for SOA Design Patterns

Welcome to SOAPatterns.org, a site dedicated to SOA design patterns.

Overview

- History
- Acknowledgements
- Notification
- Submit Feedback
- Press Release

Master SOA Design Pattern Catalog

- Master Pattern List (alphabetical)
- Master Pattern List (by category)
- Master Pattern List (PDF)
- Master Pattern List (Text)
- Pattern Notation
- Pattern Profiles
- Symbol Legend
- Contribute a Proven Pattern

SOA Candidate Patterns

- Overview
- Candidate Pattern List
- Contribute a Candidate Pattern

Design Pattern Basics

- What's a Design Pattern?
- What's a Design Pattern Language?
- What's a Design Pattern Language?
- What's a Compound Pattern?

Supplemental

- SOA Design Patterns Historical Influences
- SOA Design Patterns and Design Principles
- SOA Design Patterns and Design Granularity

View the SOA Design Pattern Catalog

You can browse through the design patterns by clicking on one of the short-cut links to the right or opening up one of the following master lists, each of which displays the entire pattern catalog in a different sorting order:

- Master Pattern List (alphabetical)
- Master Pattern List (by category)

Via any of these links you can access pattern profile tables, which provide condensed pattern descriptions based on a standard set of sections. If you are new to SOA design patterns, you should familiarize yourself with these sections and other conventions and notations used to document pattern content by studying the [Pattern Profile](#), [Pattern Notation](#), and [Symbol Legend](#) pages. If you are new to design patterns altogether, you should begin by reading through the pages under the Design Pattern Basics section in the navigation bar to the left.

View the Candidate Patterns

This site was originally used to publish the first draft of the SOA Design Patterns manuscript for an open industry review. Now that it provides access to the finalized master SOA design patterns catalog it continues to serve as a community review site for candidate patterns – proposed patterns considered “not yet ready” for inclusion in the master pattern catalog. Candidate patterns are made available for open review and feedback until they reach a state where they are considered sufficiently validated and mature so that they can be moved to the master pattern catalog.

To browse these patterns, visit the [Candidate Patterns](#) page.

Provide Feedback and Pattern Reviews

While the master pattern catalog already went several years of exhaustive reviews, there is always room for improvement. As a member of the SOA community you are welcome to provide your opinions and comments about any of the existing SOA design patterns.

You are especially encouraged to provide feedback about candidate patterns because these patterns have been proposed but not yet accepted into the master pattern catalog.

Design Patterns

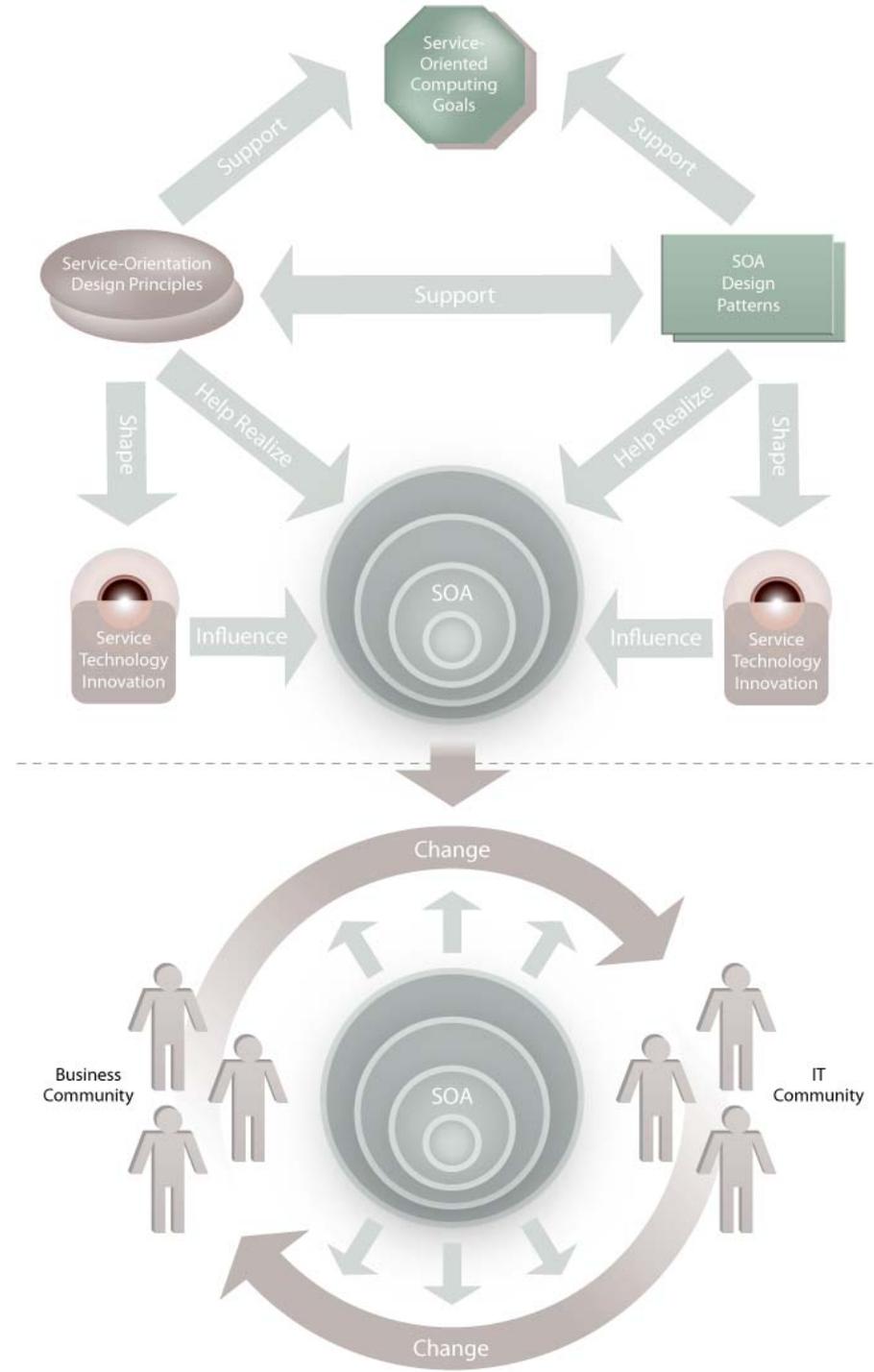
- [Annotic Capability](#)
- [Annotic Context](#)
- [Annotic Sub-Controller](#)
- [Asynchronous Queuing](#)
- [Atomic Service Transaction](#)
- [Brokered Authentication](#)
- [Canonical Expression](#)
- [Canonical Protocol](#)
- [Canonical Resources](#)
- [Canonical Schema](#)
- [Canonical Versioning](#)
- [Capability Composition](#)
- [Capability ReComposition](#)
- [Compatible Change](#)
- [Compensating Transaction](#)
- [Composition Autonomy](#)
- [Concurrent Contracts](#)
- [Contract Centralization](#)
- [Contract Denormalization](#)
- [Cross-Domain Utility Layer](#)
- [Data Confidentiality](#)
- [Data Format Transformation](#)
- [Data Model Transformation](#)

SOADoD.org is a community portal dedicated to the adoption of SOA within the DoD.

The strategic goals of service-oriented computing represent a target state that service-orientation provides a method of achieving.

The successful application of service-orientation helps leverage modern service technologies by shaping and defining requirements for service-oriented technology architectures that end up establishing an IT automation model designed to fully support the two-way cycle of change through which business and IT communities continually transition.

Amidst all of this, SOA design patterns introduce a critical success factor by providing proven design solutions and practices that support (and are supported by) service-orientation.





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