

Service-Oriented Architecture -SOA Analysis

Course Summary

Description

Geared for business and systems analysts, *SOA Analysis* is a three day in-depth SOA analysis training course that explores what SOA is, the impact of SOA, what it means in terms of today's systems and architectures, and how to apply the concepts in identifying business and systems services. This course was designed for software analysts who wish to understand what services and service-oriented architectures are and what best practices and processes to use in supporting the design and implementation of SOA-based applications. This course presents a strong perspective on services as an essential and important part of enterprise systems as well as how to identify, design, and develop of complex services using sound analysis and design techniques. The course presents a clear portrait of how a service orientation can fundamentally change the dynamics of how software is developed and "lives" within an enterprise. Students who attend SOA Analysis will leave the course armed with the required skills to support the design and implementation of realistic SOA-based business application projects. This course provides coverage of advanced SOA concepts and practices for enterprise applications. The goal of this course is to empower analysts with the knowledge and foresight they need to support the design of realistic SOA-based business application projects.

Objectives

At the end of this course, students will be able to:

- Explain the business impact of SOA
- Understand the history of services-oriented architecture and what design processes led up to SOA
- Discuss the challenges to adopting SOA in the enterprise
- Apply the concepts and principles of SOA to on-going and future projects
- Explain how Enterprise Application Integration affects the reuse of existing applications
- Relate what SOA means from an architectural perspective
- Discuss business process analysis and its relation to BPEL
- Understand the difference between OO analysis and design and SOA analysis and design
- List the various roles involved in Service-oriented Analysis and Design (SOAD)
- Perform SOA Analysis to identify useful and manageable services
- Understand the importance of business process modeling
- Explain governance and how it applies to SOA and IT in general
- Compare SOA best practices
- Understand the responsibilities crucial to governance
- Understand, at a high level, what web services bring to the table

Topics

- Introduction to SOA
- SOA in Depth
- SOA Analysis and Design
- Making SOA Work

Audience

This an intermediate and beyond level SOA training course, designed for analysts who need to identify and support the design of SOA applications and infrastructures. We will explore and apply the terminology, the specification, the processes and technologies specific to SOA. Attendees should have an extensive working knowledge with analyzing and working with enterprise applications. This is not a programming class.

Prerequisites

Students should have basic development and analysis skills and a working knowledge in the following topics, or attend Understanding Internet Architectures.

Duration

Three days

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Course Outline

I. Session: Introduction to SOA

- A. Lesson: SOA Overview
 - 1. What is a Service?
 - 2. SOA is Defined in Many Ways
 - 3. Architectural Style: Common Framework
 - 4. Loose Coupling: Spectrum of Options
 - 5. Software Agents: Services
 - 6. Interacting: Orchestrated
 - 7. SOA is Not Revolutionary
 - 8. What is the Difference Between Services and SOA?
 - 9. SOA - Business Perspective
 - 10. SOA – Technical Perspective
 - 11. SOA is Not ...
 - 12. Myths and Realities
 - 13. SOA and Web Services
- B. Lesson: SOA: The Business Proposition
 - 1. Dealing with Change - Motivation for SOA
 - 2. Typical Software Project
 - 3. Typical Software Projects – Why?
 - 4. Business Logic Gets Replicated Over Time
 - 5. Unique Interfaces Build Up Over Time
 - 6. Unique Technologies Build Up Over Time
 - 7. Unique Data Representations Build Up Over Time
 - 8. What are Implications of Each of These Issues?
 - 9. Service Model
 - 10. Service Consumer
 - 11. Service Bus
 - 12. Commonality is Critical Element of SOA
 - 13. Where are We Leveraging That Commonality?
 - 14. Service Provider
 - 15. Business Process: OpenCheckingAcct
 - 16. How Does SOA Address Replication of Logic?
 - 17. How Does SOA Address Unique Interfaces?
 - 18. How Does SOA Address Unique Technologies?
 - 19. How Does SOA Address Unique Data Schemas?
 - 20. How Does SOA Help Deal with Change?
 - 21. Leverage SOA to Empower Customers
 - 22. Leverage SOA to Empower Your Organization
 - 23. Leverage SOA to Support for Strategic Growth and Change
 - 24. Potential Benefits of SOA
 - 25. The Benefits of a Well-Designed SOA
 - 26. SOA Maturity Models Abound
 - 27. Example: IBM's SIMM
 - 28. Incremental Adoption of SOA
- C. Lesson: SOA: An Architectural Perspective
 - 1. Enterprise Application Layers

- D. Application Layers at a Glance
- E. Services and Their Formal Contracts
- F. Services Should be Stateless
- G. Objects, Components, and Services
- H. What is a Legacy System?
- I. The Challenge of Legacy Systems
- J. Limitations Associated with Legacy Systems
- K. Lesson: SOA: A Development Perspective
 - 1. Top-Down: Strategic Orientation
 - 2. Bottom-up: Tactical Strategy
 - 3. Lifecycle Phases
 - 4. SOA Roles and Skills (Existing)
 - 5. SOA Roles and Skills (New)
 - 6. Business is the Starting Point
 - 7. Service-Oriented Analysis and Design (SOAD)
 - 8. Service-Oriented Analysis and Design Process
 - 9. Service Identification
 - 10. Service Modeling Guidelines
 - 11. Model For Cross-Application Reuse
 - 12. Preventing Boundary Logic Creep
 - 13. Target A Balanced Model

II. Session: SOA in Depth

- A. Lesson: Service-Oriented Architecture
 - 1. Technical Principles
 - 2. Logical Components of a SOA
 - 3. Characteristics of a Good Service
 - 4. Generic Nature of Services
 - 5. Business Process-Driven Development
 - 6. SOA Business Modeling
 - 7. SOA Reference Architecture
 - 8. Business Versus Application
 - 9. Service Layers
 - 10. Application Services
 - 11. Functional Services
 - 12. Business Process Services
 - 13. Messaging
 - 14. When is Messaging Used?
 - 15. Two Messaging Models
 - 16. More On Publish/Subscribe
 - 17. Logical View of Publish/Subscribe
 - 18. More On Point-to-Point (P2P)
 - 19. Logical View of Point-To-Point
 - 20. Message Servers
 - 21. Messaging
 - 22. SOAP
 - 23. Common Framework: Addressing Cross-Cutting Concerns
 - 24. Role and Uses of an Enterprise Service Bus
 - 25. What Does the Enterprise Service Bus Do?
 - 26. The Challenge of Handling Transactions

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Course Outline (cont'd)

- 27. The Solution to Handling Transactions
- 28. Security
- 29. Governance and Compliance
- 30. Governance and Expertise
- 31. Governance and Service Lifecycle
- 32. Governance and Consumer/Provider Management
- 33. Challenge of Governance
- B. Lesson: SOA in Practice
 - 1. Trends in Software
 - 2. Distributed Systems: Common Patterns
 - 3. SOA: Various Terminology and Various Players
 - 4. SOA Platform Basics
 - 5. TCP/IP is at the Foundation
 - 6. HTTP Uses Basic Request-Response Mechanism
 - 7. HTTP Request: Ask an HTTP Server for Response
 - 8. HTTP Response: Server's Answer to a Request
 - 9. Service Sender/Receiver Responsibilities
 - 10. Web Services Architecturally
 - 11. High-level View of a Web Services-based SOA
 - 12. Frameworks Reduce Complexity and Support Components
 - 13. JEE: Web-Based Enterprise Applications
 - 14. JEE Defines Containers for Different Tiers
 - 15. JEE Supports MVC Principles
 - 16. JEE Encompasses Communication
 - 17. Compliant JEE Framework Ready for an Application
 - 18. JEE and SOA
 - 19. .NET Platform
 - 20. .Net - Single OS, Multiple Languages
 - 21. .NET Web Application Support
 - 22. .NET and SOA
 - 23. Issues in Integration
- III. **Session: SOA Analysis and Design**
 - A. Lesson: Service-Oriented Analysis and Design Review
 - 1. Review of Lifecycle Phases
 - 2. What is SOAD?
 - 3. Service Identification
 - 4. Service Specification
 - 5. Results: Identification and Specification
 - 6. Service Realization
 - 7. SOA Reference Architecture
 - 8. Results: Realization
 - 9. Systematic Process to Achieving These Results
 - 10. Challenge of Governance
 - B. Lesson: Service Identification
 - 1. SOAD Process: Where ARE we?
 - 2. Service Identification
 - 3. Top Down: Domain Decomposition
 - 4. Business Use Case: Order Processing
 - 5. Initial Process Model: Order Processing
 - 6. Bottom Up: Asset Analysis
 - 7. Asset Analysis for Order Processing
 - 8. Cross-Cutting: Goal-Service Modeling
 - 9. Goal-Service Modeling for Order Processing
 - C. Lesson: Modeling Business Processes
 - 1. BPML/BPMN Overview
 - 2. BPMN Fundamentals
 - 3. Swimlanes
 - 4. Swimlanes: Pools
 - 5. Flow Objects: Events
 - 6. Flow Objects: Activities
 - 7. Flow Objects: Gateways
 - 8. Connecting Objects
 - 9. Artifacts
 - 10. Revisiting: Order Processing
 - 11. BPEL Overview
 - 12. Comparing BPEL and BPMN
 - 13. Top-down Process Design
 - 14. Importing WSDL and/or XSD
 - 15. Process Elements
 - 16. <partnerLink>
 - 17. <variables>
 - 18. <sequence>
 - 19. Expression Language
 - 20. Fault Handler
 - 21. Compensation Handlers
 - 22. Lab: Exploring BPEL
 - 23. SOAD Process: Where ARE we?
 - 24. Service Identification
 - D. Lesson: Service Specification
 - 1. SOAD Process: Where ARE we?
 - 2. Focus of Service Specification
 - 3. Specification Supports Design of Service Details
 - 4. Service Analysis
 - 5. Elimination Criteria: Connection to Business
 - 6. Elimination Criteria: Composability
 - 7. Elimination Criteria: Feasibility
 - 8. What Happens to Eliminated Candidates?
 - 9. Service Analysis Refines the Service Portfolio
 - 10. Service Specification: Dependencies
 - 11. Service Specification: Compositions
 - 12. Service Specification: Nonfunctional Requirements
 - 13. Service Specification: Messages
 - 14. Service Specification: State Management
 - 15. Service Specification: Wrap up
 - 16. Lab: Service Specification

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Course Outline (cont'd)

- 17. Shifting to Component Analysis and Specification
- 18. Entity-Centric Service Components
- 19. Task-Centric Service Components
- 20. Functional Service Components
- 21. Service Component Specification
- 22. Results: Identification and Specification
- E. Lesson: Service Realization
 - 1. SOAD Process: Where ARE we?
 - 2. Service Realization
 - 3. SOA Reference Architecture
 - 4. Application Services
 - 5. Functional Services
 - 6. Business Process Services
 - 7. Solving Problems Using Layers
 - 8. Service Realization: Allocation
 - 9. Service Realization: Asset Feasibility
 - 10. Service Realization Decisions
 - 11. Service Design Guidelines
 - 12. Designing SOAs by Composition
- IV. **Session: Making SOA Work**
 - A. Lesson: Common Framework: Infrastructure
 - 1. ESB Overview
 - 2. The Role of ESB in a SOA
 - 3. Typical Service Bus Functionality
 - 4. Security
 - 5. ESB Scenarios and Analysis
 - 6. ESB Issues
 - B. Lesson: Common Framework: Governance
 - 1. IT Governance Overview
 - 2. Importance of IT Governance
 - 3. Extremes in Governance Models
 - 4. Implementing IT Governance
 - 5. Why SOA Governance?
 - 6. Symptoms of Effective SOA Governance
 - 7. SOA Governance Defined
 - 8. SOA and IT Governance
 - 9. Responsibilities of Governance
 - 10. Governance Responsibilities
 - 11. Governance Policies Point the Way
 - 12. Processes Enforce/Enable Policies
 - 13. Metrics Provide Visibility of Effectiveness
 - 14. Service Reusability Metrics
 - 15. Challenges of SOA
 - 16. Areas Ripe for SOA Governance
 - 17. Service Architecture
 - 18. Technology and Product Selection
 - 19. Development
 - 20. QA/Security/Regulatory Compliance
 - 21. Consumer/Provider Management
 - C. Lesson: SOA Best Practices
 - 1. Planning
 - 2. Standardizing
 - 3. Service Modeling Guidelines
 - 4. Preventing Boundary Logic Creep
 - 5. Target a Balanced Model
 - 6. Service Design Guidelines
 - 7. Managing
 - 8. Using Patterns
 - 9. Avoiding Anti-Patterns
 - 22. Reference Architecture
 - 23. Governance Support Requirements
 - 24. SOA Information Management
 - 25. SOA Quality Management
 - 26. Aligning Business and IT
 - 27. Use of Business Component Model
 - 28. Governance Entity Tasks
 - 29. Governance in Service Development Lifecycle (SDL)
 - 30. Governance in Service Lifecycle