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 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
- 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: Orchestration
      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?
   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
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
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

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