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Module 4: Service Provisioning and Governance

Mediating Services

Process Innovation

Services Discovery

Process Composition

Service Consumption

Service Provisioning

enterprise SOA Operations

enterprise SOA Lifecycle Management
Module 4: Service Provisioning and Governance

Target:

- Understand the difference between inside-out and outside-in service development
- Understand the importance for a strict governance process regarding service provisioning
- Understand the SAP development methodology for enterprise services
- Understand the role of and the need for a central Services Repository
1. enterprise SOA Service Development Governance Process

2. Investment Approval Process - Service Design Example

3. Service Implementation

4. Summary
Inside-Out
- Start with (existing) implementation in the backend system
- Interface semantics pre-defined and reflect directly implementation (virtual Interfaces allow some view-like mappings)

Outside-In - Recommended -
- Central design of interfaces that make business sense in SAP NetWeaver Enterprise Services Repository
- Using global data types
- Reference to Governance Process
- Generation of proxies from abstractly modeled interface
- Implementation of “glue code” between proxy and business function
- Implementation can be changed without changes in interface
Enterprise Service characteristics

Characteristics of Enterprise Services
- Harmonized Enterprise Model
- ESR
- Business functionality
- Global Data Types
- Open standards
- Documentation

Degree of Harmonization & Standardization across SAP Solutions
Harmonization & Standardization Effort
Deployment units
- Are groups of decoupled process components that can be operated separately.

Process components
- Describe a part of the value chain. That part is typically executed by one department (in large companies).
- Process Components are therefore logical groups of business objects.

Business objects
- Represent a specific view on well-defined and outlined business content. Business objects are defined free of business functionality redundancies.
- A business object belongs to exactly one process component.

Service interfaces
- Are groups of service operations.

Service operations
- Each belongs to exactly one business object. A business object has multiple operations.
Asynchronous services (A2A and B2B)

<table>
<thead>
<tr>
<th>Request/Confirmation</th>
<th>Query/Response</th>
<th>Notification</th>
<th>Information</th>
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<tbody>
<tr>
<td>Other Application</td>
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<tr>
<td>Request</td>
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<tr>
<td>Confirmation</td>
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<td>mySAP Application</td>
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<tr>
<td>Database</td>
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Synchronous services
Manage BO
(for master data objects)

- BO action
- Specific value help for BO

Rules for naming of message types

Rules for operation granularity and naming

Rules for grouping of service operations into interfaces

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Global Data Types

- Delivery Terms
- Address
- ProductID

Global Data Type

Business Semantics

- Amount
- Binary Object
- Code
- Date Time
- Identifier

CCTS Core Data Type

Business Semantics

- float
- String

W3C Data Type

- Re-usable Data Type
- SAP-wide approved
- Business-related subject matter
- Usage-neutral
- Maximally-defined Data Types
- Documented in accordance with the documentation templates
- Based on international standards
- Defined in ES Repository using XML
- Basis for further Data Types

1. Core data types and aggregated data types are modeled according to UN/CEFACT Core Component Technical Specification, or CCTS for short (ISO 15000-5).

2. The description of the modeled data types as XML schema in the ES Repository complies with the guidelines of UN/CEFACT XML Naming and Design Rules for CCTS (XMLNDR), which describes the unique XML schema serialization of data types based on CCTS.
Enhanced Web Service Meta Model

- easy search and discovery through unambiguous classification
- business logic based on defined business objects
- meaningful granularity through business object assignment

- same business context always represented by the same Data Type
- easy composition through no/easy conversions and mapping
- use of open semantic standards

- easy search and discovery through unambiguous naming conventions
- meaningful granularity through predetermined operations
- reusability through predetermined operations
- well known service behavior
Agenda

1. enterprise SOA Service Development Governance Process

2. Investment Approval Process - Service Design Example

3. Service Implementation

4. Summary
Enterprise Service:
- Model Service Interface – ESR
- Create Proxy Classes and Implement Service - Abap: SE 80, Java: NWDS/CAF
- Publish Service

Services Registry Responsible

ESR Responsible

Generating Web Service for Rule – SAP NetWeaver BRM

ABAP/Java Developer

Java Developer
Investment Approval Process - Required Services

**Search Products by ID or Description**
- Will be developed in this module

**Read Product Data:**
- SAP ERP 6.0 Enterprise Service
- Process Component: Product Data Maintainance
- Business Object: Material
- Interface: Manage Material In
- Operation: Read Material Basic Data (MaterialBasicDataByIdQueryResponse_In)

**Compare Purchase Request with Limits:**
- Composite specific service! (Business Rule)

**Create Purchase Order:**
- SAP ERP 6.0 Enterprise Service
- Process Component: Purchase Order Processing
- Business Object: Purchase Order
- Interface: Manage Purchase Order In
- Operation: Create Purchase Order (PurchaseOrderCreateRequestConfirmation_In)

**Collect changes in Purchase Request:**
- Composite specific service!
Service Design: Business Object Model

Service Requirement: The Service offers an operation that provides the possibility to find **materials** by ID or description

**Deployment Unit**
- The deployment Unit depends on the System you would like to deploy the service on (e.g. ERP Foundation)

**Process component**
- The process component “**Product Data Maintenance**” offers services to maintain Product Data.

**Business objects**
- The Business Object “**Material**” as part of the “Product Data Maintenance” Process Component acts as a representation of product specific information.
Service Design: Interface Pattern

Service Requirement: The Service offers an operation that provides the possibility to find materials by ID or description.

Use of „Query Business Object“ pattern:

Service Interface
- Query Material In

Service Operation
- Find Material By ID And Description
  (MaterialSimpleByIdAndDescriptionQueryResponse_In)

Message Types
- IN: MaterialSimpleByIdAndDescriptionQuery
- OUT: MaterialSimpleByIdAndDescriptionResponse

Exemplary:
- For message types that have the term Simple in the name, only a few attributes are expected as the result of the search and these are displayed in a list.
- For message types that have the term BO in the name, only a few attributes are expected as part of the name, are used for the operation, and there can only be one such operation for each service interface.
- Operations that have Find BO in the name search for data records that are references by BO in a second BO.

Example:
- BO is a purchase order and BO is a material. To model a search for material data records using an order data you must model a service interface with the name Query. Purchase Order and an operation with the name Find Material by Order Data. You also get the name for the message type from this (Purchase Order Material by Order Data Query).
Service Design: Data Types

Service Requirement: The Service offers an operation that provides the possibility to find materials by ID or description.

DataType for Input Message must contain either an ID or a description of a product:

Create Data Type:
- MaterialSimpleByIDandDescriptionQueryMessage_sync:
  - ProductID (Reuse of Datatype: ProductInternalIDContent – one occurrence)
  - Description (Reuse of Datatype: SHORT_Description – one occurrence)

DataType for Output Message must contain search results as a List of Products:

Create Data Type:
- MaterialSimpleByIDandDescriptionResponseMessage_sync:
  - ProductList (new GDT: ProductEntry with one to many occurrences)

Create Data Type:
- ProductEntry:
  - ProductID (Reuse of Datatype: ProductInternalIDContent – one occurrence)
  - Description (Reuse of Datatype: SHORT_Description – one occurrence)
  - Amount (Reuse of Data Type: Amount – one occurrence)
- Modeling and Designing Service Interfaces -

Enterprise Service Builder (ESR)
1. enterprise SOA Service Development Governance Process

2. Investment Approval Process - Service Design Example

3. Service Implementation

4. Summary
Proxy Generation:
- Import WSDL into NWDS via Enterprise Services Browser and create proxy classes automatically

Service Implementation:
- Composite Application Framework (CAF) or pure Java to implement functionality or "glue code" to call existing functionality

Service Configuration
- Use the NetWeaver Administrator for configuration and endpoint creation

Publishing and Classification:
- Publish and classify services within the Services Registry
- Proxy Generation, Service Implementation and Publishing (JAVA) -
Central Service Development in the **ABAP Workbench** (Transaction SE80)

**Proxy Generation:**
- Enterprise Services Browser within the ABAP Workbench to create proxy classes

**Service Implementation:**
- ABAP Workbench to code functionality or “glue code” to call existing functionality

**Endpoint Creation:**
- SOA Management (Transaction SOAMANAGER) to create Endpoints and configure the implemented service.

**Publish WebService:**
- Transaction WSPublish to publish Service to Registry
- Proxy Generation, Service Implementation and Publishing (ABAP) -
1. enterprise SOA Service Development Governance Process

2. Investment Approval Process - Service Design Example

3. Service Implementation

4. Summary
Summary

- Outside-in development is the preferred service development approach
- A governance process can secure reusability and easy interaction between services
- SAP offers a clear methodology for service development based on a harmonized business model using well defined patterns and open standards
- The SAP Enterprise Services Repository is the central meta-data repository for service models and objects
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