Agenda

• Application Areas of SESA

• The SUPER Project
  – Aims & Project Structure
  – Business Process Management (BPM)
  – Semantic Enhancements for BPM
  – SUPER Architecture
  – Demonstration Use Case
SESA Application Areas
• Several Application Areas
  – Data & Knowledge Management
  – Enterprise Application Integration (EAI)
  – E-Commerce (B2B and B2C)
  – …

• Common Benefits of SESA
  – advanced information processing
  – semantic interoperability
  – bridging the human – system gap
  – more flexible Web Service usage via Goals
  – handling & resolution of heterogeneities
  … and reduction of development & maintenance costs
Example 1

Virtual Internet Service Provider

• a Virtual Internet Service Provider (VISP)
  – provides customized product bundles for specific client requests
  – chooses & aggregates offers from different suppliers

• Aims
  – for cost efficiency, the operational workflow shall be automated
  – automation of supplier selection and product bundling

• Problems
  – distributed actors (communication over the Web)
  – environment:
    • many suppliers
    • highly dynamic environment (new suppliers, changing offers)
  – heterogeneous I&C technologies in supply chain
    • different back-end systems (SAP, Biztalk, etc.)
    • heterogeneous information (ontology, data formats, etc.)
VISP Scenario Overview

VISP workflow
1. VISP receives client request for specific product bundle
2. best offer detection
   o searches for adequate offers from suppliers
   o chooses and bundles best offers
3. customer notification, product selection, purchase order
4. VISP executes purchase order by interacting with suppliers
5. purchase confirmation to client
WSMO enabled Solution

- VISP as Web service
- client request as goal
- suppliers provide offers via Web services
- automated offer detection and bundling via Web service discovery & composition
- automated execution via VISP orchestration
- ontologies serve as semantic data model
- (semi-) automated heterogeneity handling by mediators

1. Goal Formulation
2. discovery / composition
3. Goal Resolution
4. automated execution
5. Goal Resolution

WSMX

VISP

Suppliers

Ontology Domain Knowledge

Mediator Heterogeneity Handling

Client
Example 2

**EAI in Telecommunications (BT)**

- Wholesale’s B2B Gateway
  - Web-based gateway for integration of suppliers
  - aim: automation of supply chain management

- Background in Telco Domain:
  - Enterprise Application Integration is a largely manual process
  - costs are high (between 30% & 50% of all IT spend is on integration)
  - time and costs involved make some propositions commercially unviable
  - trend towards Service Orientated Architecture …
  - but will this be enough? Doubts about levels of scalability and automation achievable
BT Wholesale’s B2B Gateway

 ebXML Messaging conforming to ebXML BPSS

Trading Partner

Trading Partner

Trading Partner

UK ISPs

B2B Gateway

BT Wholesale

Testing

Provisioning

Repair

Billing
Problems with Existing System

- Many service providers have little experience with B2B integration technology
- Large resource investment required for realizing the BT Wholesale (over 150 UK ISPs are integrated)
- XML messages can be complex
- Semantics expressed in documents and spreadsheets
- Whole process can take several months
WSMO-enabled Architecture

Trading Partner X

- Message Ontology
- Choreography Ontology
- Domain Ontology

Data Mediator

Process Mediator

BT Wholesale

- Message Ontology
- Choreography Ontology
- Domain Ontology

Adapter

Data

Choreography

<wsml>
<.../>
<wsml/>

<order>
<.../>
<order/>

<wsml>
<.../>
<wsml/>

<order>
<.../>
<order/>
Benefits from WSMO

• Trading partner effort significantly reduced
  – Can communicate with own data/process representations
    • Semantic data mappings defined once.
    • mediators automatically convert.

=> *No need for extra internal programming or glue*

• Linking to Telco Domain ontologies
  enables BT to provide a ‘standardised’ interface without need to change internal systems.
Economical Results

• **Existing System:**
  – current costs approximately 4 Person Months per partner for integration
  – 150 partners added to wholesale gateway in past 4 years
  – current costs approximately £1 million (€ 1.45 million) per year

• **Gained Cost Efficiency (estimated):**
  – integration effort reduced by 40-60% per partner
  – potential savings of up to £600,000 (€ 840,000)

[assessment by BT Wholesaler team]
The SUPER Project
Acknowledgement & Copyrights

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• SUPER stands for
  Semantics Utilized for Process Management with and between Enterprises
• EU FP6 Integrated Project (IP)
• Duration:
  – 36 months
  – April 2006 – 2009
• Overall Budget: ca 9 Mio €
• 19 Partners
• Website: http://www.ip-super.org/
The Consortium

1. SAP AG, Germany (Coordinator)
2. ETEL AUSTRIA AG, Austria
3. IBIS PROF. THOME AG IBIS, Germany
4. IBM RESEARCH GMBH, Switzerland
5. IDS SCHEER AG, Germany
6. INTELLIGENT SOFTWARE COMPONENTS S.A., Spain
7. LEOPOLD-FRANZENS UNIVERSITAET INNSBRUCK, Austria
8. MIP Consorzio per l'Innovazione nella Gestione delle Imprese e della PA, Italy
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12. SIRMA GROUP CORP., Bulgaria
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15. AKADEMIA EKONOMICZNA W POZNAHIU, Poland
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17. UNIVERSITÄT STUTTGART, Germany
18. TELEKOMUNIKACJA POLSKA S.A., Poland
19. CEFRIEL - Società consortile a Responsabilità Limitata, Italy
Problem Setting

• **Business Process Management (BPM)**
  – management, implementation, and monitoring of processes in enterprises
  – many BPM technologies exists
  – SOA as new principle

• **BUT: several insufficiencies**
  – Business – IT – Divide (different worlds)
  – incompatible modelling languages
  – Business Process Modeling & Execution
    • syntactic process specification languages
    • hard-wired Web Service Execution (inflexible)

• **Aim of the SUPER project:**
  (1) “ontologize” the BPM Life Cycle
  (2) enhance BPEL with WSMO
Problem Setting

Here is my business process!
I think this solves my business problem nicely...

A¹ → A² → A³ → A⁴

Nice try, but it won’t run...
You need to specify the services that perform each step!
Problem Setting

I don’t understand about these technical details!
This is my view on the process...

A¹ → A² → A³ → A⁴

o.k. no problem, I will help you...
Problem Setting

This is cumbersome! Why do I always need IT staff to solve my business problems?

It takes too long to get these folks, they use different terminology than I do...

I am happy to describe what the activities do in my terms. Can the system be smart enough and find the right services itself???
Semantic Matching of Activities and Services

Semantic Web Services
Better Support Business Users

Why do I have to draw everything?
Why do I have to use “expressions” and that technical stuff at all?
Why isn’t my description sufficient?
Matching Model Representations & Semantics

Here is my business process!

Business Representation

IT Representation

Wow! This is perfect – nothing left to do for me!
The Critical IT / Process Divide

Business Experts’ Perspective: Processes

Querying the Process Space

Manual Labor

Process Implementation

IT Implementation Perspective
Aim of SUPER

Business Experts’ Perspective: Processes

Mechanized Mediation based on Machine Reasoning

Machine-Accessible Representation of Processes, Process Fragments, and IT Infrastructure as Semantic Web Services

IT Implementation Perspective

SCOPE of SUPER

Querying the Process Space

Implementation

Process
SUPER Technology Stack

- Making sense of a domain\problem
- Communication tool
- What is it all about?
- Solution maps
- Mind maps
- Ad-hoc modelling techniques
- ...

- Visualizing\specifying business process
- Focus: Business Problem
- Who does what, when, how and why?
- Usually multiple layers
- Business Scenario Maps
- Event-driven process chains
- Flowchart techniques
- BPMN
- ...

- Process execution specification
- Formal, clearly specified grammar
- Focus: Implementation
- Which component is called when, how, by whom with which data?
- BPEL
- ...

- Web service encapsulation
- Focus: Implementation
- Which components can and should be exposed how as services?
- WS*
- ...

- Implementation of components
- Programming languages
- ...

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03.09.2007
Business Process Management Overview
**BPM’s Parents and Definition**

- **Business Process Management (BPM)**
- **Office Automation** (since 1980)
- **CSCW / Groupware / Workgroup Systems**
- **Workflow Systems** (since 1985)
- **EAI** (since 1990)
- **Business Process Modelling** (since 1990)
- **Business Reengineering** (since 1990)
- **Continuous Improvements** (since 1990)
- **SOA** (since 2000)
- **Business Objects** (since 2000)
- **Business Process Mngt.** (since 2000)

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BPM’s Parents and Definition

- there are several competing definitions

- focus of different BPM approaches:
  - focus on documentation
  - focus on process and execution
  - focus on IT architecture
  - focus on costs and risks
  - focus on business strategy
  - etc.
BPM – Enterprise Modeling

• model of an enterprise
  – organisational structure
  – business functions
  – business processes
  – information
  – IT applications

• model is an abstraction of reality

• used by many different stakeholders
  – views needed
  – abstraction levels needed
  – lifecycle concept needed
  – different languages, notations and formalisms needed
Enterprise Model

- **Customer**
  - License
  - License Service
  - License Available
- **Get License**
- **Get PurchaseOrder**
- **Purchase Order Extracted**
- **Content Identifier**
  - Purchase Order Received
  - Get PurchaseOrder
  - Service
  - Interface
  - Content Identifier
- **Load Content**
  - Content Library Service
  - Content Ready for Download
  - Content
- **Send Content & License**
  - Digital Content
  - License
- **Cell Phone Interface Service**
- **Cell Phone**

© Sebastian Stein
too complex
Enterprise Model

• possible abstraction layers are:
  – requirements definition
  – design specification
  – implementation specification
  – execution and run-time models

• possible views are:
  – organisational view
  – product view
  – data view (information architecture)
  – function and IT view
  – process view
Business Process Modeling & Execution

Michael Stollberg
Business Process Lifecycle

1. Analysis
   ■ gather requirements
   ■ document current state (as-is)

2. Design
   ■ document to-be
   ■ specify how to get there

3. Implementation/Execution
   ■ implement to-be in organisation and IT
   ■ change management

4. Control and Monitoring
   ■ monitor execution
   ■ measure outcome and analyse it

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BPM Languages & Technologies

• many different frameworks for enterprise architecture:
  – Zachman Framework (very comprehensive)
  – ArchiMate (simplified version of Zachman)
  – ARIS (promoted by IDS Scheer)
  – TOGAF (strong IT focus)
  – IAF (promoted by Cap Gemini)

• process design & execution technologies:
  – BPMN (notation for (IT oriented) business processes)
  – EPC (notation for business processes)
  – Petrinets (formalism often used for workflow modelling)
  – UML Activity diagrams
  – XPDL (execution language for process definitions)
  – BPEL (execution language for process definitions)
  – XLANG (execution language promoted by Microsoft)
  – ...
Two Level Programming

- Two-Level Programming Approach = Separation of
  - Control/business logic
  - discrete functionalities

- Relies on earlier Workflow Technology

© Dimka Karastoyanova
Dimensions in Workflow

- Workflows have minimum 3 dimensions:
  1. **What?** = control logic
     *which tasks*
  2. **Who?** = organization
     *who must execute which task*
  3. **What with?** = infrastructure
     *which tool must be used to execute a task*

- There are multiple notations and languages for workflows
Workflow Languages

- Industry has tried to get an agreement on a common Workflow language since early 1990’s
- Now the industry agreed on BPEL (that’s why it’s interesting)
  - Portability
  - Interoperability

© Frank Leymann, Joerg Nitzsche
• Use Web Services as Infrastructure
• Benefits:
  – data exchange over the Web
  – integration on interface level
• BPEL as quasi standard
• No direct support for people/organizational dimension yet, but efforts towards this (e.g. BPEL4People)
Why Web Services?

- Web service technology provides a “virtual component model” for using components in a loosely coupled manner.

- When using a Web service the supporting container hides its “middleware idiosyncrasies“ (component model behind the implementation of the Web service, the invocation protocol etc.)

- Web service technology does not require a new component model for implementing components (well, except for BPEL 😊)
Virtualizing Components

Virtual Component

Web Service

implements
(E)JB
J2EE

implements
StP
DBMS

implemented
Assembly
.NET

Concrete Component
Ingredients Of WSDL

Interface („What”)

Port Type

Supports

Operation

Input, Output & Faults

Message

How to invoke (doc exchange, rpc)

How to encode (serialization)

Binding

Transport: Formats & Protocols

Hosts & Implements

Implements

Port

Provides

Service

Endpoints („Where”)

© Frank Leymann
The Role of Bindings

Client

Port

Type

Binding

SOAP/HTTP

POJO/JMS

ASCII/SMTP

RDF/TSpace

…/…

Port1

Port2

Port3

Port4

Portk

© Frank Leymann, Joerg Nitzsche
What is BPEL?

- **A language to specify behaviour of business processes**
  - Between Web services…
  - …and as Web service
- **Same language to define**
  - **Executable processes**
    - Can be performed within all compliant environments (portability)
    - Interoperability between heterogeneous environments
  - **Abstract processes**
    - Specify constraints of message exchange
    - Are “views” on internal processes
- Combination of graph-based language (IBM WSFL) and calculus-based language (Microsoft XLANG)
BPEL Processes Use Web Services

© Frank Leymann
Business Processes as Web Services

• A BPEL Process is also a Web Service
  ► Provides functionality in terms of WSDL port types and operations
Aggregating Web services

BPEL provides a recursive aggregation model for Web services

© Frank Leymann
Example

TravelService

TravelAgent

HotelService

Hotel

AirlineService

Airline

CCService

CCCompany

ordenTrip
receiveItinerary
overnight?
getHotel
getFlight
chargeCC
bookRoom
bookFlight
payBill

© Frank Leymann
BPEL Elements

- **Partner Links** specify the roles of all external partners involved in the process as well as the role(s) of the process itself.

- **Variables** can be defined either in the process or in a scope used as input- and output-containers of interaction activities & to assign activities.

- **Correlation Sets** are used to correlate messages that belong to the same process instance.

- **Handlers** can be used to define exception handling and compensation.

- **Activities** define the actual control logic.

© Joerg Nitzsche
Control Logic

- Sequential execution – sequence
- Parallel execution of tasks → Flow, links
- Branching → if then else
- Loops: while, repeat until

© Zhilei Ma
Data Manipulation

• Data Flow in BPEL
  – No explicit data flow modelled
  – Data flow implicit via global/scoped variables, access via name
  – Variables can be defined as
    • WSDL message type
    • XML Schema type (simple or complex)
    • XML Schema element

• Data Manipulation
  – BPEL Assign activity
  – Allows copying (parts of) variables
    • XPath can be used to identify these parts

• Example

```xml
<assign>
  <copy>
    <from>$po/lineItem[@prodCode=$myProd]/amt * $exchangeRate</from>
    <to>$convertedPO/lineItem[@prodCode=$myProd]/amt</to>
  </copy>
</assign>
```
Architecture of a BPEL Engine

Process Engine

- Deployment Component
- Build Time Data (Process models)
- Instance Data (Process Instances)
- Navigator
- Event Manager
- Communication Manager

Invocation and Management Framework

© Dimka Karastoyanova, Tammo van Lessen, Joerg Nitzsche
* Receive may cause an Instantiation of a Process
Semantic BEPL
Enhancing BPEL with WSMO
Idea & Approach

• Make BPEL able to deal with SWS
  – better flexibility
  – ensure semantic interoperability

• Use WSMO Framework & Technologies to:
  1. semantically describe process data on the basis of ontologies
  2. flexible Web Services invocation via Goals
     – BPEL activity realized as WSMO Goal
     – dynamic discovery / composition / execution of necessary Web services at runtime
  3. use WSMO mediators to resolve heterogeneities
From Syntactic to Semantic BPEL

a) BPEL Process

b) Semantic BPEL Process

WSMO Goal

Goal

Ontology

Mediator

WS Environment
discovery
composition
mediation
execution
dynamic detection at runtime
BPEL Business Protocols

Partner Links

Partner 1

Partner 2

W
X
Y
Z

A
B
C
D

1
2
3
4

making semantics real.
Benefits

• Higher Flexibility for Web service usage

• Explicate Semantic Meaning of Data

• Automated Handling of Potential Heterogeneities

• Make process definitions better understandable
SUPER Architecture
Architecture Overview

SUPER Execution Environment

Semantic BPEL Execution Engine

Semantic Execution Environment

Modelling Tool

Monitoring Tool

Mining Tool

SUPER Tooling

Semantic Service Bus

Deployment Component

SUPER platform services

Composition

Discovery

Mediation

Translation

SUPER Repositories

Semantic Web Services

Execution History

Business Process Library
Deployment Process: Semantic Process Artefacts Bundle (SPAB)

- BPEL4SWS
- WSDL
- WSMO
  - WSDL
- WSMO Mediators
- WSMO Goals
- Deployment descriptor
Semantic Business Process Execution

1. Request to Service
2. Achieve Goal
3. Discover Service
4. Invoke Service
5. Return result to engine
6. Return Result

- Semantic BPEL Execution Engine
- Semantic Execution Environment
- Web Service
- SWS
- Execution History
- Mediation
- SUPER platform services
- SUPER Repositories
Demonstration Example
Content On Demand Scenario

- a client wants to purchase on-demand digital content
- the provider defines a sBPEL business process

Client Web Interface

Provider

sBPEL Process

SESA Exec Environments

WS

(1) request

(2) WSMO goals

(3) execution over the Web

(4) execution results

(5) result
Web-based Client Interface

Purchase Content

Please first provide login information and then choose the content you wish to download. You will be provided the URL and the licence.

Login information

Username: 
Password: 

Content

Please provide the Content-Id of the content you wish to purchase.

Content-id: 

Submit request
The Content Purchase Process
BPMO plug-in
TID’s Purchase Digital Content Process
Content Purchase Process - Details

Web Client

![Diagram of Content Purchase Process](image-url)
Content Purchase Process - Details

BPEL4SWS Process

[Diagram of content purchase process using BPMN notation]
Content Purchase Process - Details

SWS

SWS

making semantics real.
Representation in BPMO

Client
- Start
- Purchase Content
- Receive Purchased Content

Purchase Digital Content Process
- Start
- Receive Content Request
- Get License
- Receive License
- Get URL
- Receive URL
- Send License and URL

License Server
- Start
- Receive License Request
- Send License

Packager
- Start
- Receive URL Request
- Send URL
Process Execution in SUPER

1. Request to Service
2. Achieve Goal
3. Discover Service
4. Invoke Service
5. Return result to engine
6. Return Result

SUPER Execution Environment

Semantic BPEL Execution Engine

Semantic Execution Environment

SUPER Repositories

SWS

Execution History

Mediation

SUPER platform services

Web Service
Process Execution in SUPER

1. Customer
   - Service Task: Purchase content

2. Service provider
   - Receive Task: Receive content request
   - Get URL
   - Get license
   - Send Task: Send license and URL

3. License server
   - Receive license request
   - Send License

4. Package
   - Receive Task: Receive URL request
   - Send Task: Send URL

5. [UserID and ContentID]
6. [URL and License]
Process Description in BPEL4SWS

```xml
<b4s:conversations>
  <b4s:conversation b4s:name="Packager" b4s:goalURI="http://www.ip-super.org/ontologies/prereview#goalGetURL" />
  <b4s:conversation b4s:name="LicenseServer" b4s:goalURI="http://irs.open.ac.uk/superPrereview#goalGetLicense" />
</b4s:conversations>

<sequence sa:modelReference="http://www.ip-super.org/ontologies/prereview#actServiceProvision">
  <receive name="receiveContentRequest"
    sa:modelReference="http://www.ip-super.org/ontologies/prereview#recContentRequest"
    partnerLink="ServiceProvider"
    portType="spwsdl:ServiceProviderPortType" operation="requestContent"
    variable="contentRequest" createInstance="yes" />

  <flow sa:modelReference="http://www.ip-super.org/ontologies/prereview#actFlow_1">
    <extensionActivity>
      <b4s:invoke name="invokeGoalGenerateLicense"
        modelReference="http://www.ip-super.org/ontologies/prereview#actInvokeGoalGenerateLicense"
        b4s:inputVariable="contentRequest" b4s:outputVariable="contentURL"
        b4s:conversation="Packager" />
    </extensionActivity>

    <extensionActivity>
      <b4s:invoke name="invokeGoalGenerateURL"
        modelReference="http://www.ip-super.org/ontologies/prereview#actInvokeGoalGenerateURL"
        b4s:inputVariable="contentRequest"
        b4s:outputVariable="contentLicense"
        b4s:conversation="LicenseServer" />
    </extensionActivity>

  </flow>

<reply> ... </reply>
</sequence>
```
Process Description in BPEL4SWS

```xml
<b4s:conversations>
  <b4s:conversation b4s:name="Packager" b4s:goalURI="http://www.ip-super.org/ontologies/prereview#goalGetURL" />
  <b4s:conversation b4s:name="LicenseServer" b4s:goalURI="http://irs.open.ac.uk/superPrereview#goalGetLicense" />
</b4s:conversations>

<sequence sa:modelReference="http://www.ip-super.org/ontologies/prereview#actServiceProvision">
  <receive name="receiveContentRequest"
    sa:modelReference="http://www.ip-super.org/ontologies/prereview#recContentRequest"
    partnerLink="ServiceProvider"
    portType="spwsdl:ServiceProviderPortType" operation="requestContent"
    variable="contentRequest" createInstance="yes" />

  <flow sa:modelReference="http://www.ip-super.org/ontologies/prereview#actFlow_1">
    <extensionActivity>
      <b4s:invoke name="invokeGoalGenerateLicense"
        modelReference="http://www.ip-super.org/ontologies/prereview#actInvokeGoalGenerateLicense"
        b4s:inputVariable="contentRequest" b4s:outputVariable="contentURL"
        b4s:conversation="Packager" />
    </extensionActivity>
    <extensionActivity>
      <b4s:invoke name="invokeGoalGenerateURL"
        modelReference="http://www.ip-super.org/ontologies/prereview#actInvokeGoalGenerateURL"
        b4s:inputVariable="contentRequest" b4s:outputVariable="contentLicense"
        b4s:conversation="LicenseServer" />
    </extensionActivity>

  </flow>

<reply> ... </reply>
</sequence>
```
## Semantic Business Processes Monitor

<table>
<thead>
<tr>
<th>Event Type</th>
<th>Event Information</th>
<th>Generated By</th>
<th>Timestamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>End Activity Execution</td>
<td>__unnamed [<a href="http://schemas.xmlsoap.org/ws/2004/03/business-process/%5Dsequence@45">http://schemas.xmlsoap.org/ws/2004/03/business-process/]sequence@45</a> (OSequence)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>End Activity Execution</td>
<td>reply (OReply)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>Start Activity Execution</td>
<td>reply (OReply)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>End Activity Execution</td>
<td>aggregateResult (OAssign)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>Start Activity Execution</td>
<td>aggregateResult (OAssign)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>End Activity Execution</td>
<td>invokeGoalGenerateLicense (OExtensionActivity)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:24 CET 2007</td>
</tr>
<tr>
<td>End Achieve Goal</td>
<td>Goal: goalGetURL</td>
<td>WSMX</td>
<td>Tue Jan 23 17:31:23 CET 2007</td>
</tr>
<tr>
<td>Start Achieve Goal</td>
<td>Goal: goalGetURL</td>
<td>WSMX</td>
<td>Tue Jan 23 17:31:17 CET 2007</td>
</tr>
<tr>
<td>Start Activity Execution</td>
<td>invokeGoalGenerateLicense (OExtensionActivity)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:14 CET 2007</td>
</tr>
<tr>
<td>End Activity Execution</td>
<td>invokeGoalGenerateURL (OExtensionActivity)</td>
<td>SBPELEE</td>
<td>Tue Jan 23 17:31:14 CET 2007</td>
</tr>
<tr>
<td>End Achieve Goal</td>
<td>Goal: goalGetLicense</td>
<td>IRS</td>
<td>Tue Jan 23 18:31:14 CET 2007</td>
</tr>
</tbody>
</table>
Process Response

Result of the Execution of the Purchase Content Process

Thanks for your purchase!

Please find below the URL and the license of the requested content.

Content access information
URL: http://youtube.com/watch?v=buISOz9QjI
License: "THE WORK IS PROVIDED UNDER THE TERMS OF THIS CREATIVE commons PUBLIC LICENSE"
References
References BPM Foundations


