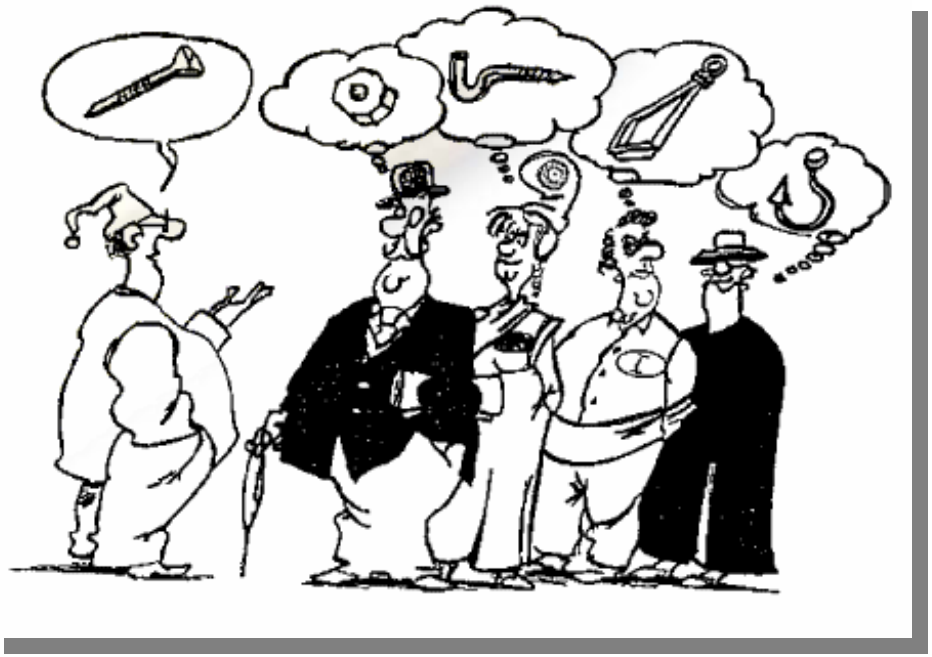
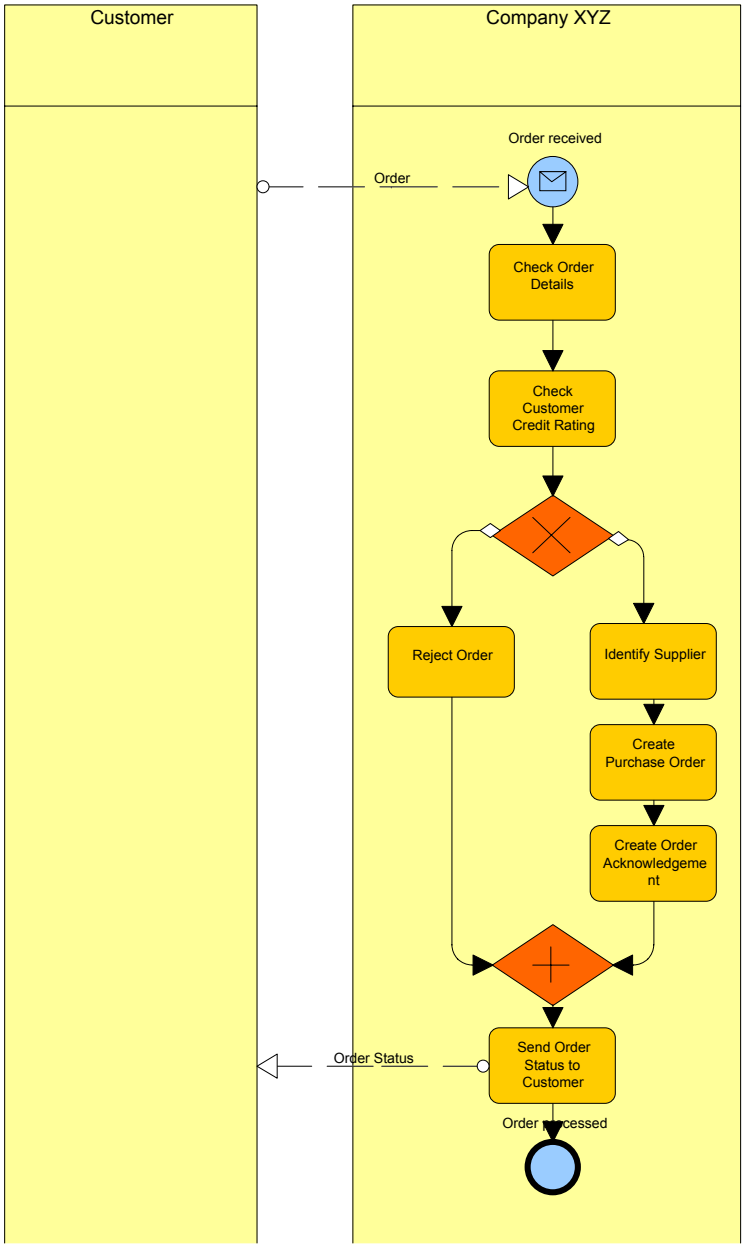
Generic BPEL Processes: Integrating Process Design and Execution Based on Generic Reuse and MDA

Dirk Stähler
Divisional Director
OPITZ CONSULTING

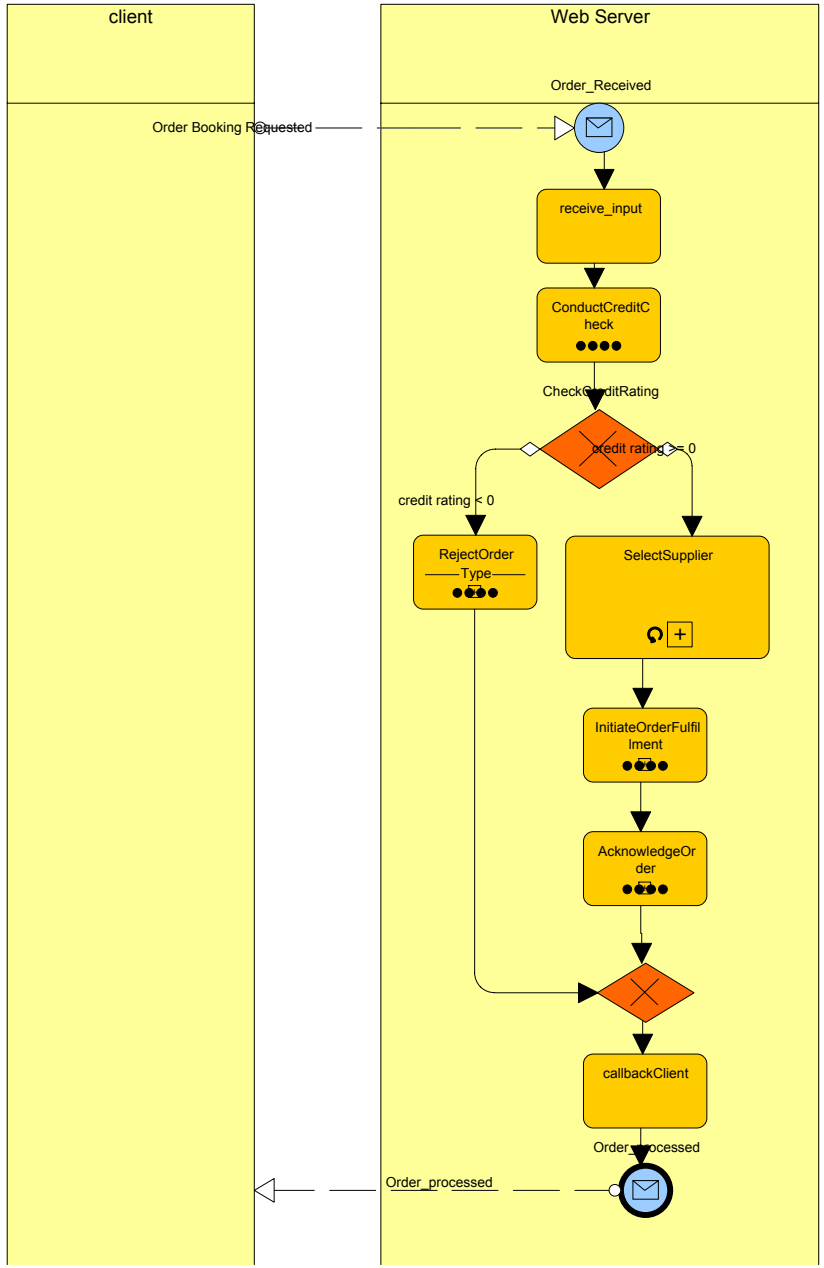
The Problem:
"Engineering Gap" between
Business Engineering and Application Engineering!



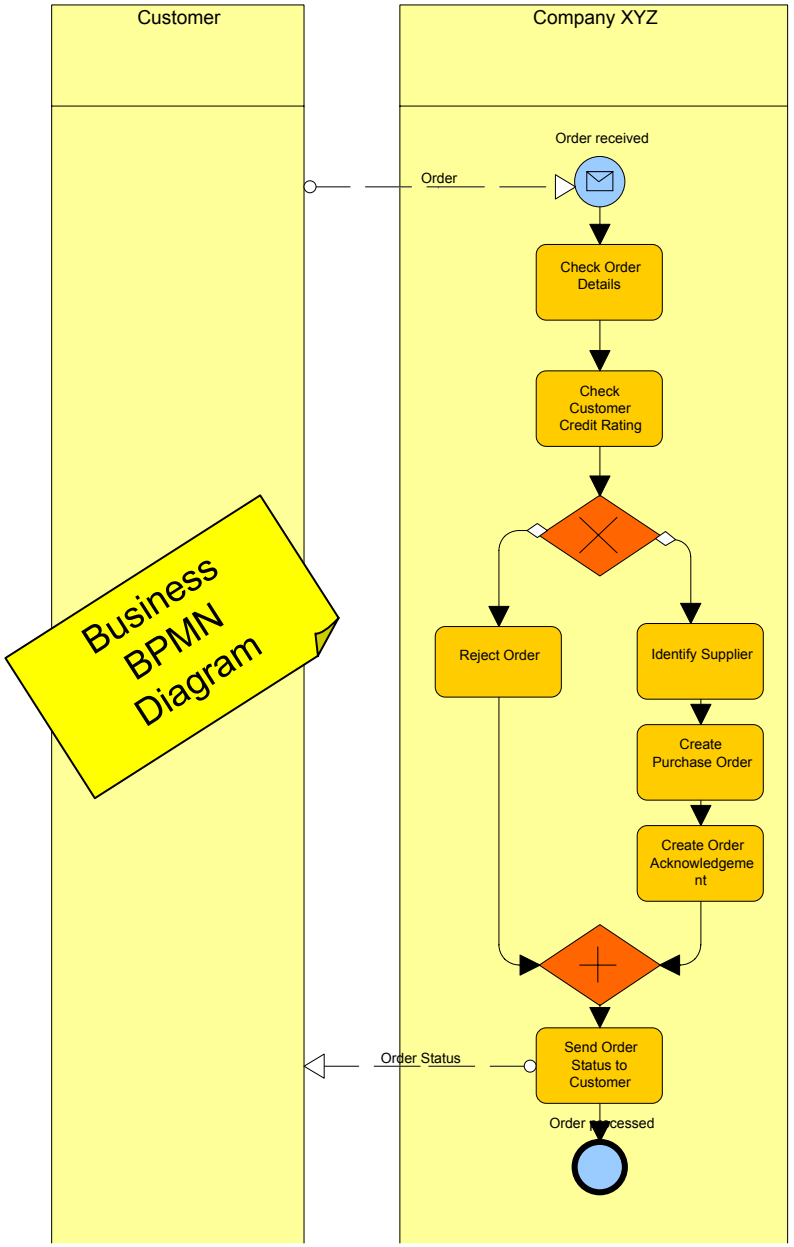
Business Process



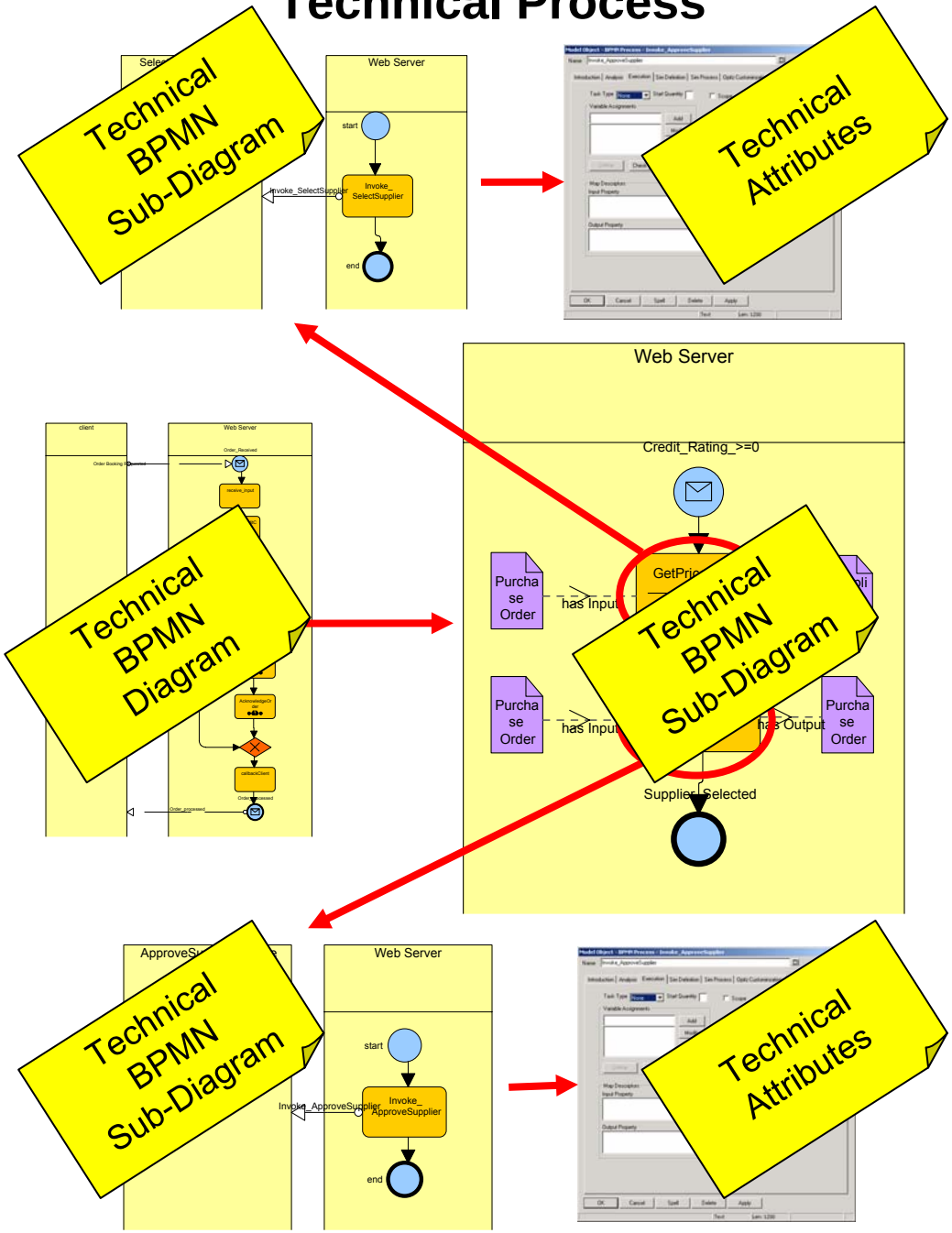
Technical Process



Business Process



Technical Process



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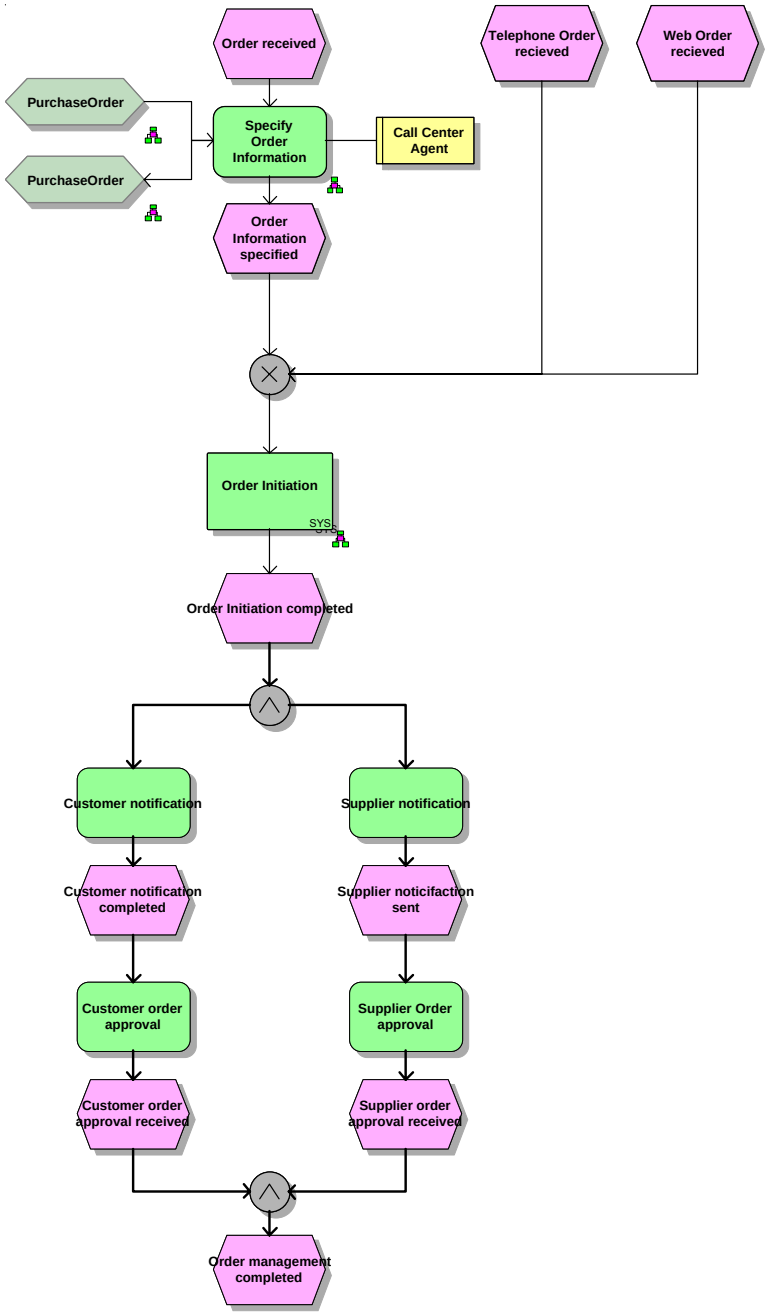
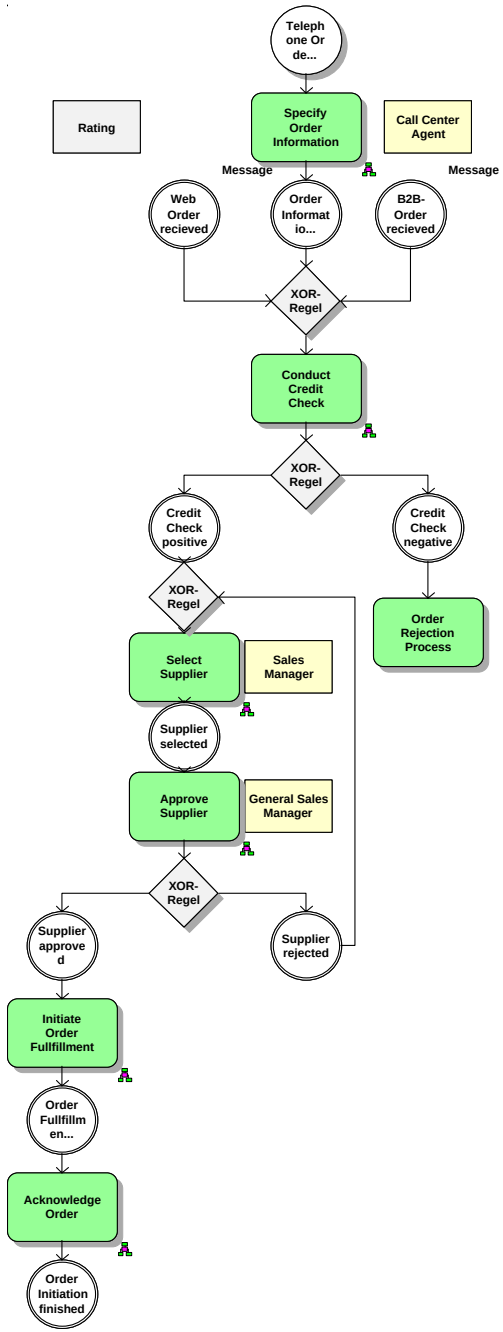
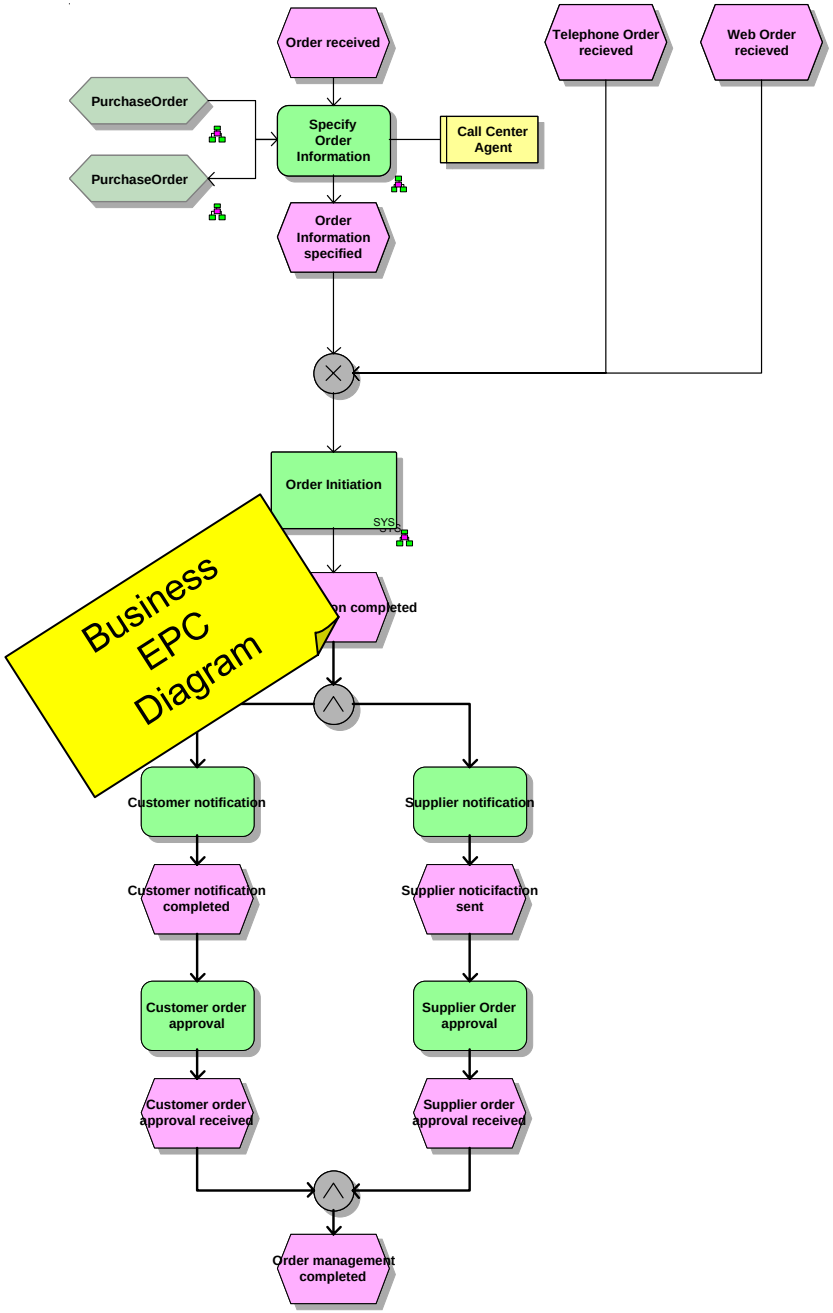


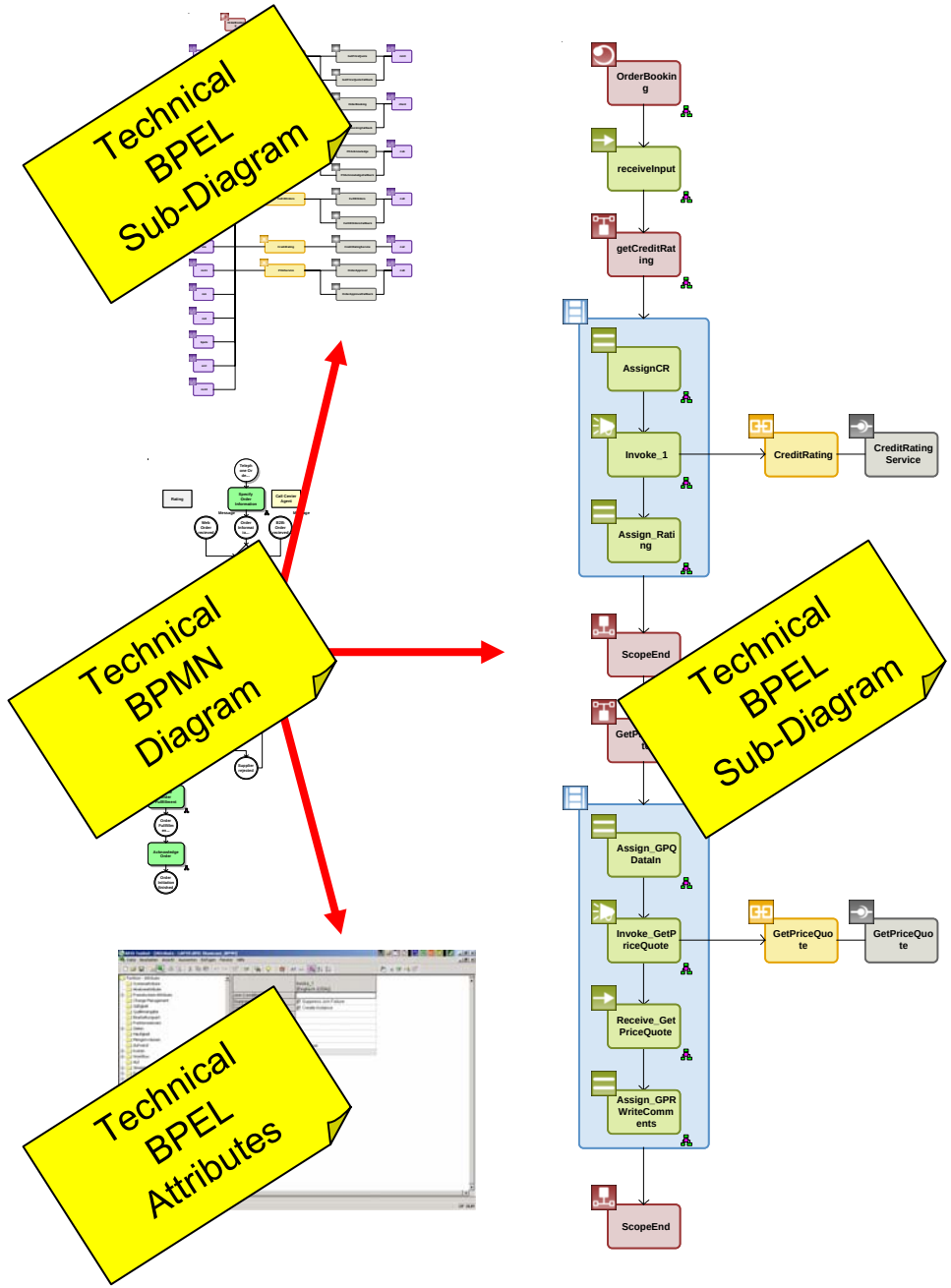
Technical Process



Business Process

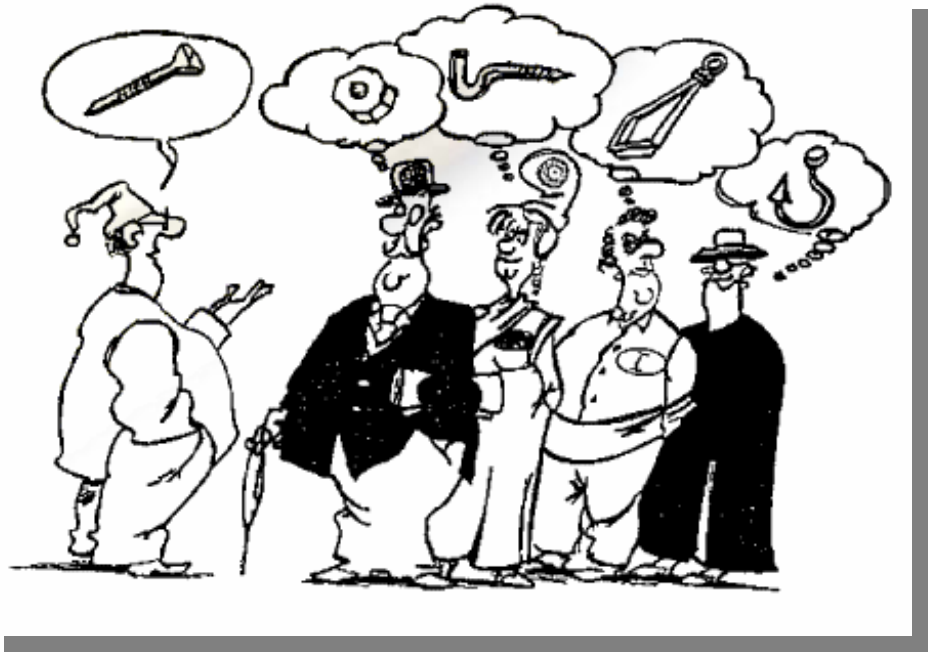


Technical Process

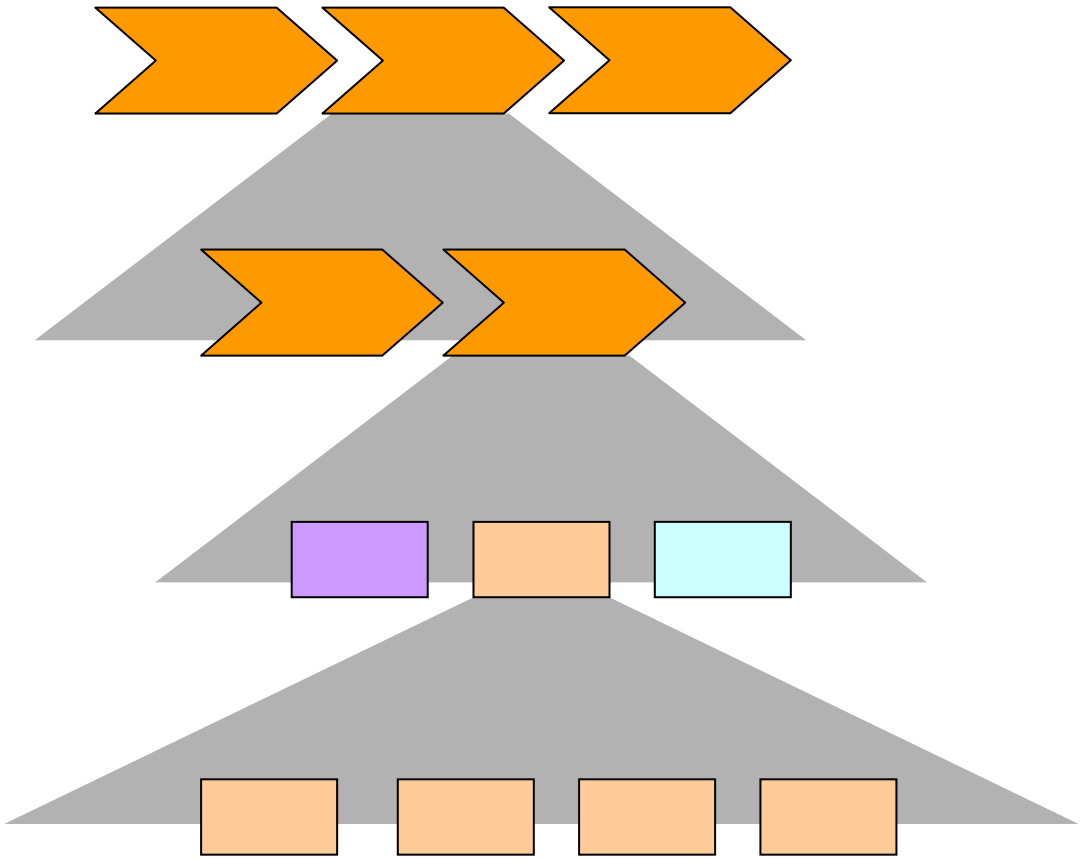


- Questions
  - Do you think that business and technical models will be designed by the same person?
  - Do you think that the structure and content within business and technical models will be the same?
    - How can we ensure that the business process models will be still valid for tasks beside SOA?
      (communication, simulation, compliance…)
    - How can we achieve that the technical SOA configuration is shielded from but controllable by the business process?
    - How can we separate business and IT relevant content and still link it together?

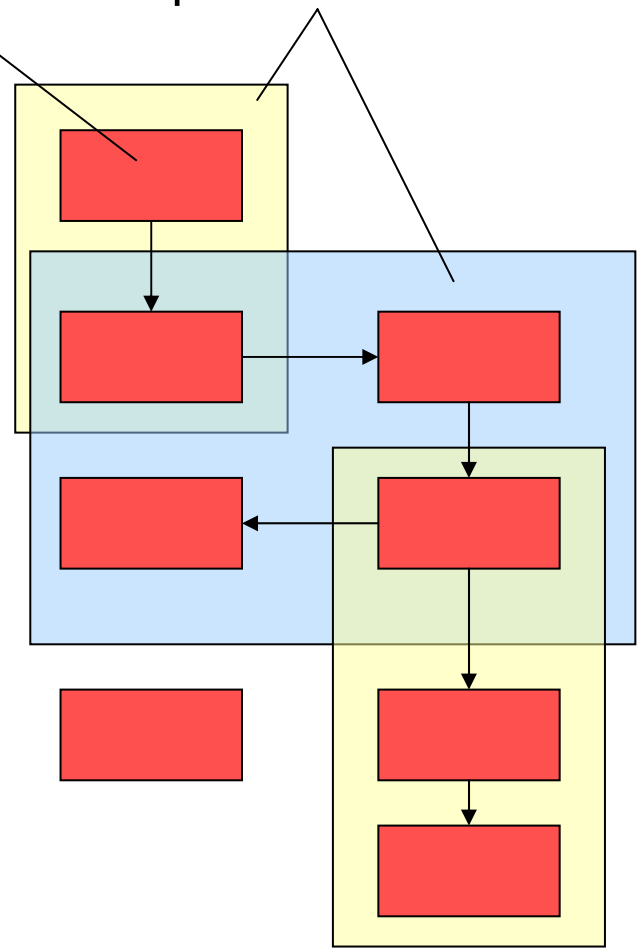
Methodological Background: Why do different models emerge in the SOA world?



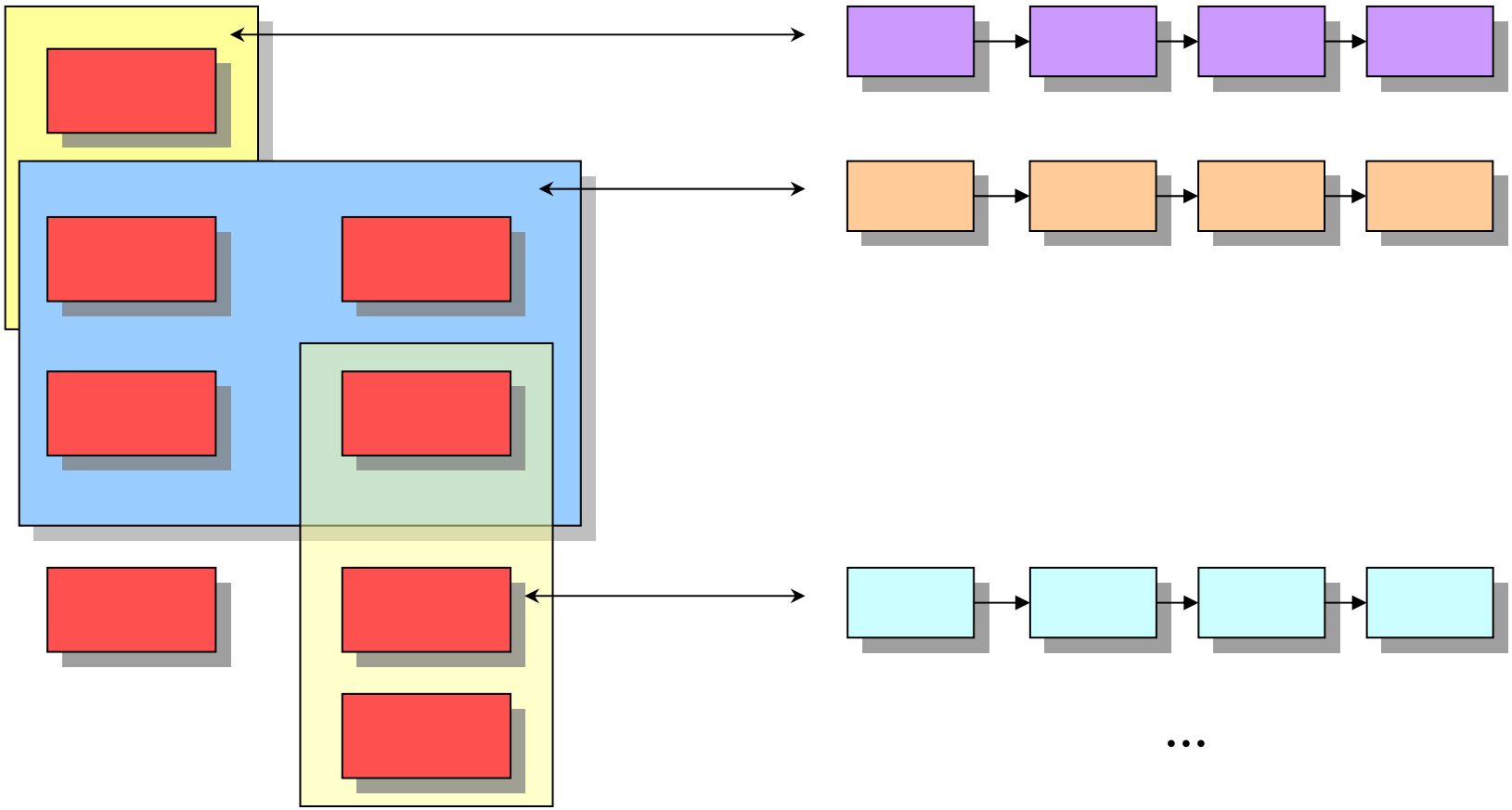
Business Process Structure

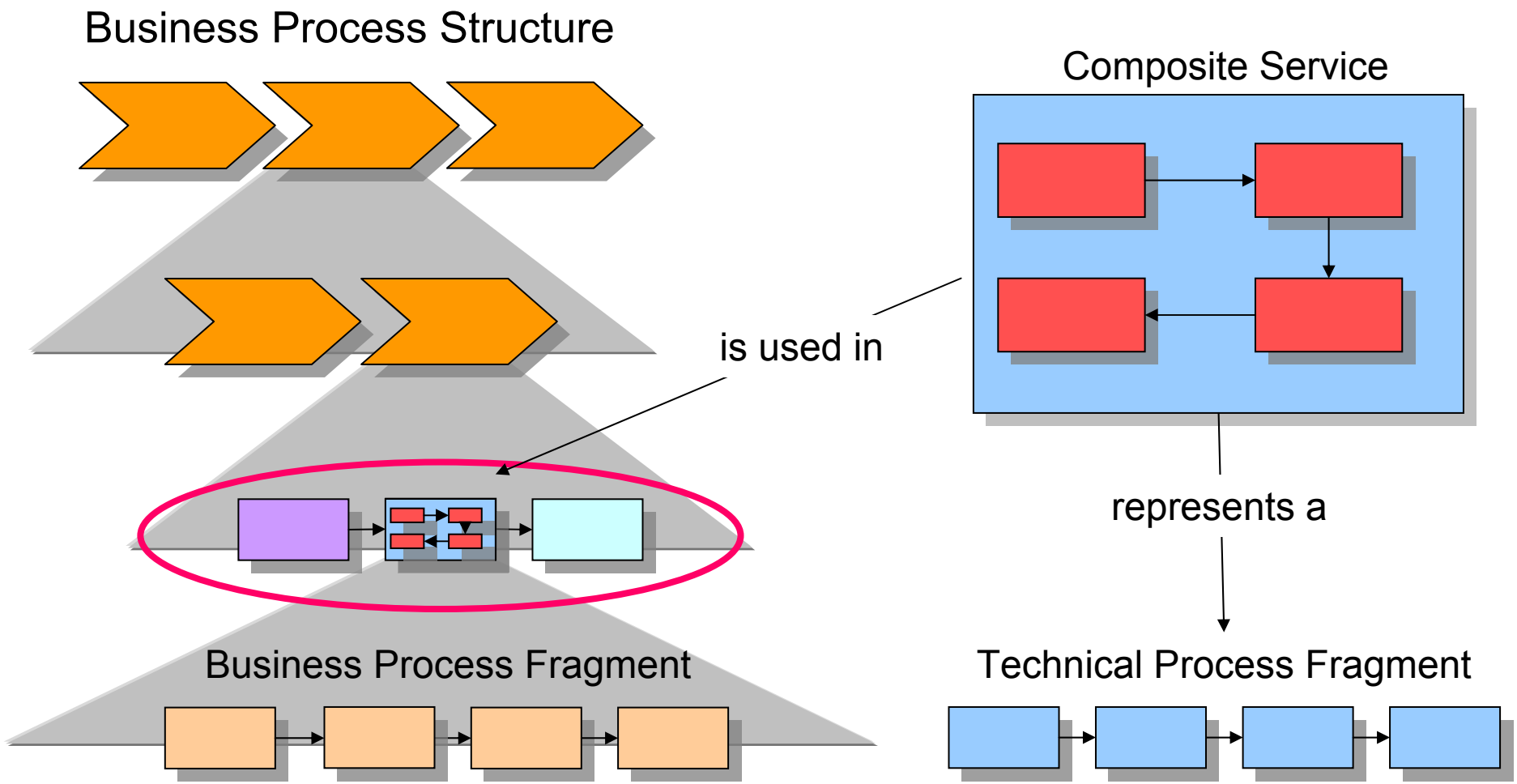


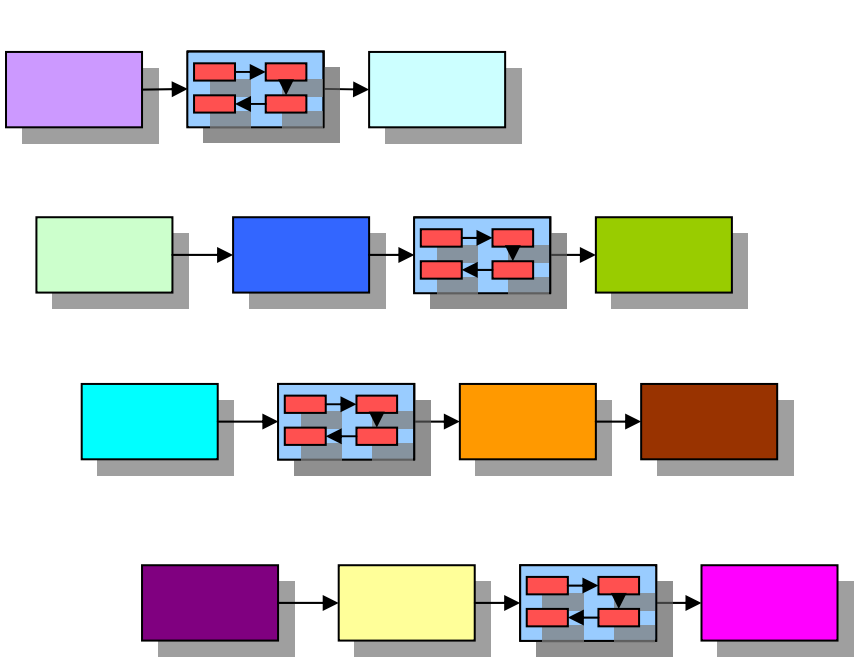
Service / Composite Service Structure



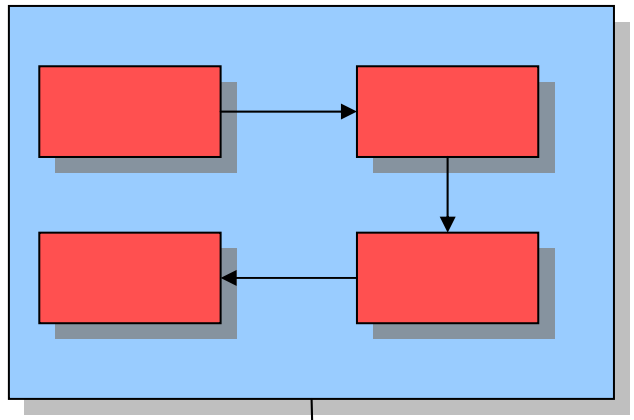
Each Service / Composite Services represents
“a business process fragment (with one or many activities)”




Business Process Structure
Composite Service
is used in
represents a
Business Process Fragment
Technical Process Fragment

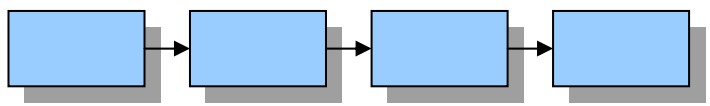


Composite Service

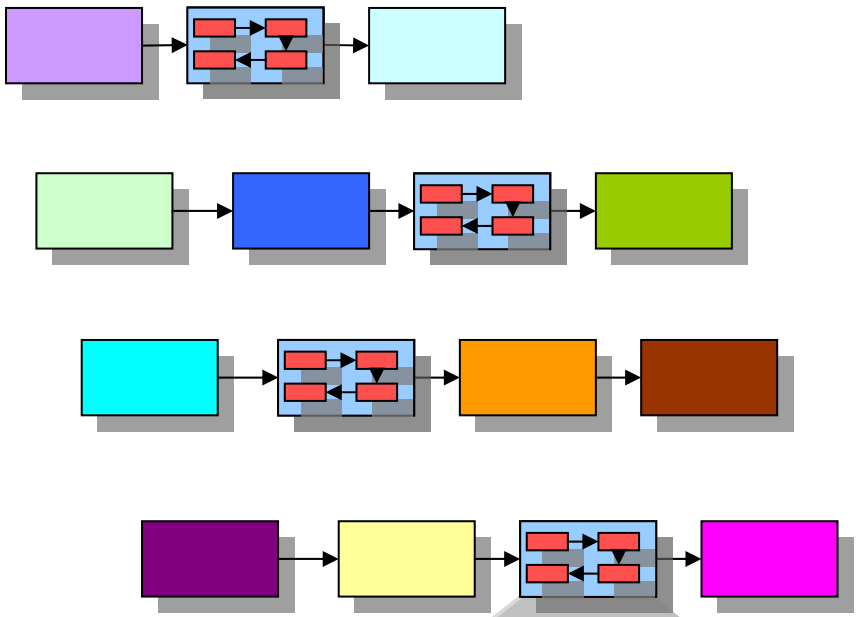


represents a

Technical Process Fragment



1 …n Relationship between
Business Processes and a
Technical Process Fragment



These two types of processes have different targets.

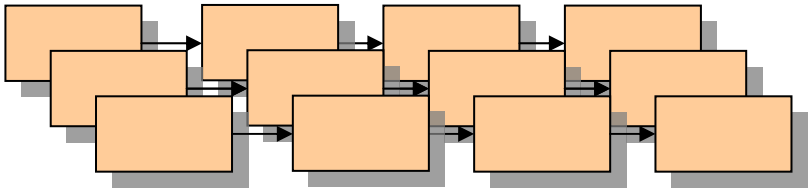
Due to this they represent different:

- Syntax
- Semantics

Business Process Fragment

Technical Process Fragment

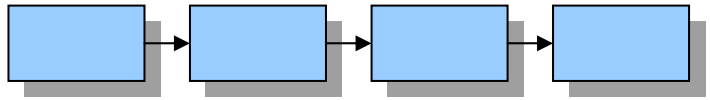
Business Process Fragments



- Business point of view
- Contextual driven, with references to predecessors and successors
- Usually more than one modeled business process used within various business scenarios

⇒ Used for process communication, simulation, compliance,…

Technical Process Fragment

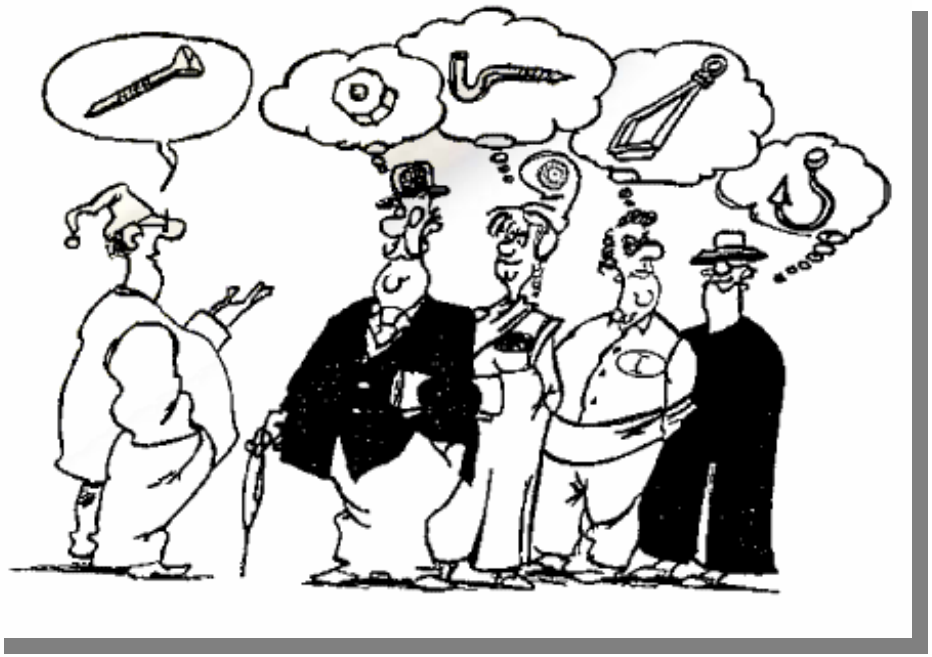


- Technical point of view
- Data and interface driven, designed to be automated
- Usually only one automated business process (represented by a service)

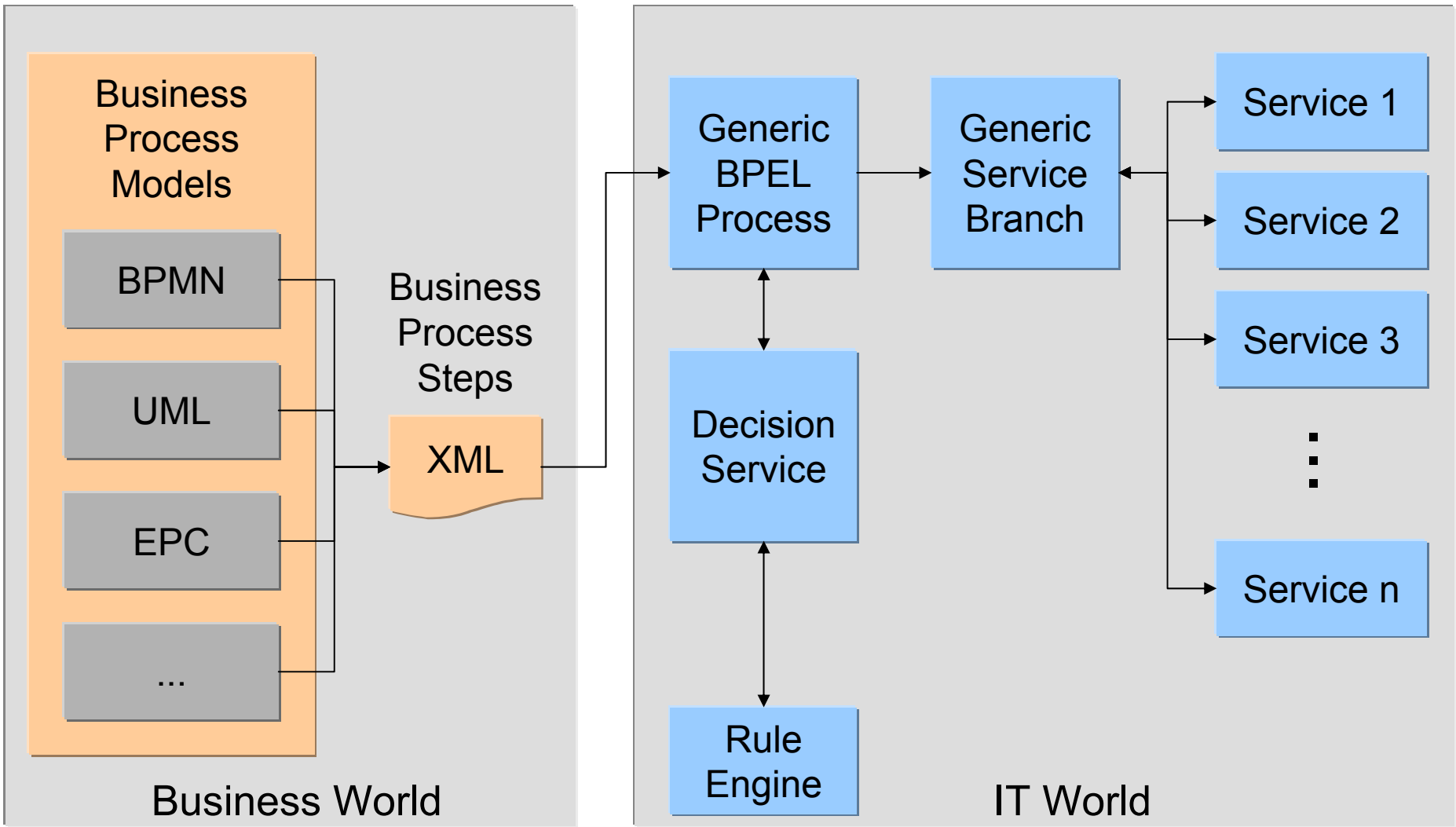
⇒ Used for process execution

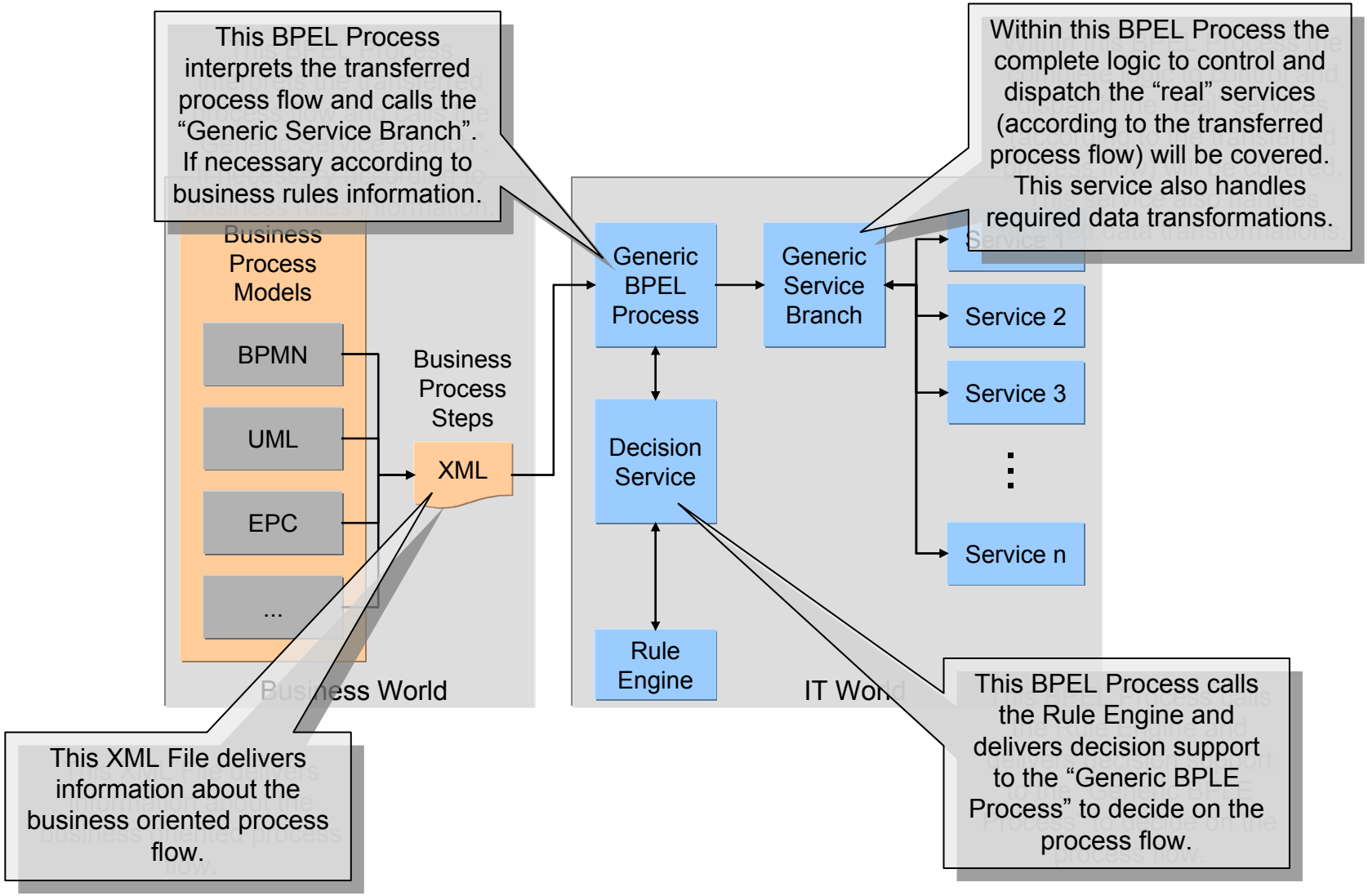
- **What are physicist doing when the complexity within a model becomes to big?**
- **...they change the scale!**
- **This means „from picture to film“!**
- **... or from a Traditional Process Modeling and IT Implementation to an Integrating Process Design and Execution Based on Generic BPEL Processes and MDA Techniques**

The Solution:
The “Divide and Conquer” approach in
Business Engineering and Application Engineering!



- Challenges in combining business processes with technical processes
  - Create a connection between the business and IT world without semantic mixture
  - Ensure flexibility on the process modeling side
  - Ensure stability on the IT modeling side
  - Secure re-usability of implemented IT processes within the business world
- Solution: “industrialized” production of processes using one generic BPEL process for many business processes


Business Process Models
BPMN
UML
EPC
...
Business Process Steps
XML
Business World
Generic BPEL Process
Generic Service Branch
Service 1
Service 2
Service 3
Service n
Decision Service
Rule Engine
IT World


This BPEL Process interprets the transferred process flow and calls the "Generic Service Branch". If necessary according to business rules information.
Within this BPEL Process the complete logic to control and dispatch the "real" services (according to the transferred process flow) will be covered. This service also handles required data transformations.
Business Process Models
BPMN
UML
EPC
...
Business Process Steps
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Business World
Generic BPEL Process
Generic Service Branch
Decision Service
Rule Engine
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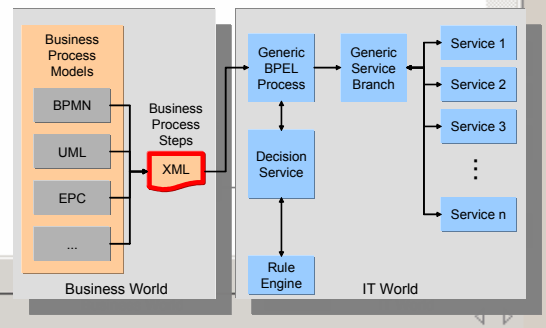
Service n
IT World
This XML File delivers information about the business oriented process flow.
This BPEL Process calls the Rule Engine and delivers decision support to the "Generic BPLE Process" to decide on the process flow.

Altova XMLSpy - [Showcase2.xml]

File Edit XML DTD/Schema Schema design XSL/XQuery Authentic View Browser Tools ADVANCED Window Help

```
<?xml version="1.0" encoding="UTF-8" ?>
- <activities>
  - <activity name="Kundenkreditrahmen pruefen" start="true" service="Credit Rating Service">
    - <next_activities>
        <next_activity name="Kundenanruf bearbeiten" />
      </next_activities>
    </activity>
  - <activity name="Kundenanruf bearbeiten" service="">
      <description>Dies ist ein Dummy Prozess. Der Prozess kann sich verzweigen. Eine Verzweigung wird durch mehrere
        Optionen unter "next_activities" definiert.</description>
    - <next_activities>
        <next_activity name="Zaehle Kundenanzahl in Warteschleife" />
        <next_activity name="Frage nach Anrufgrund" />
      </next_activities>
    </activity>
  + <activity name="Zaehle Kundenanzahl in Warteschleife" service="">
  + <activity name="Halte Kunden in Warteschleife" service="">
  + <activity name="Frage nach Anrufgrund" service="">
  + <activity name="Aenderung der Kundendaten" service="">
  + <activity name="Grund der Beschwerde erfragen" service="">
  + <activity name="Beschwerde erfassen" service="">
  + <activity name="Bestellung aufnehmen" service="">
  + <activity name="Liefertermin ermitteln" service="">
  + <activity name="Kundenzufriedenheit erfragen" service="">
  - <activity name="Telefonat mit Kunde beenden" service="">
      <description>nett verabschieden, Hoerer auflegen</description>
      <next_activities />
    </activity>
  </activities>
```



Text Schema/WSDL Authentic Browser

Showcase2.xml

XMLSpy v2005 rel. 3 U Registered to Dirk Stähler (Opitz Consulting) ©1998-2005 Altova GmbH Ln 4, Col 9 CAP NUM SCRL

Oracle JDeveloper Developer Preview - GenericBPEL2.jws : GenericBPELProcess2.jpr : C:\Eigene_Dateien_2_Source\OMG_Days\GenericBPEL2\Gen...

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Applications

DecisionService.bpel | GenericBPELProcess2.bpel | GenericServiceBranch.bpel

Drill Down Stack:

ations
ctivityApplication2
Service
Application Sources
service
JavaWebService1
Resources
WebServices.deploy
Web Content
AMCallCenter2
tensionsdk
enericBPEL2
BPELWorkerProcess2
Integration Content

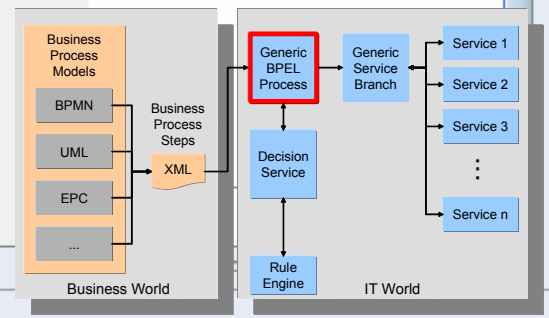
GenericBPELProce...

BPEL Structure
Variables
Process
Message Types
Correlation Sets
Schemas
Partner Links
Process
Activity Structure
Process - Generic
Properties

Show Detailed Node Informat...

Source | BPEL

Diagram | Source | History



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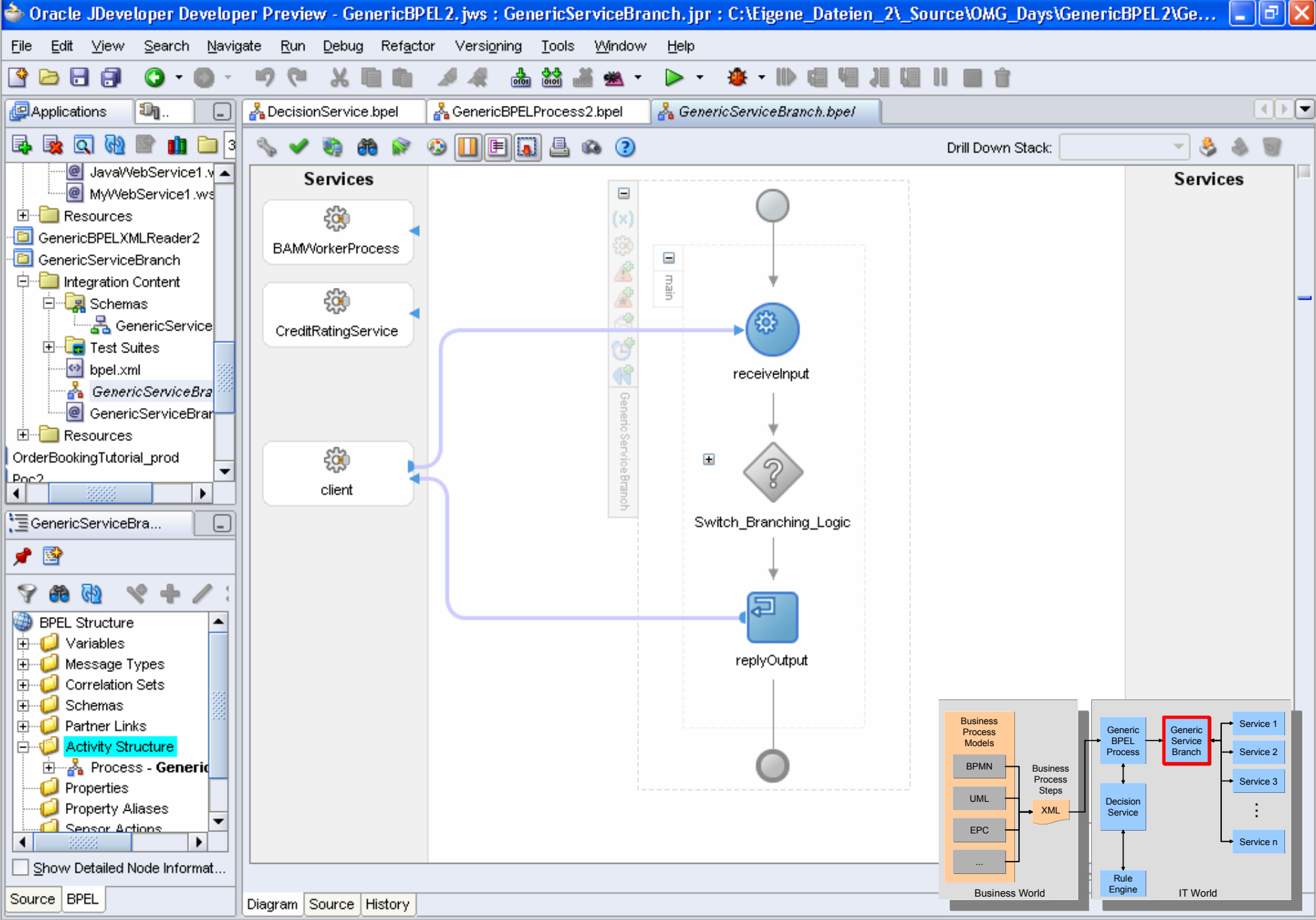
BPEL editor


Oracle JDeveloper Developer Preview - GenericBPEL2.jws : GenericServiceBranch.jpr : C:\Eigene_Dateien_2_Source\OMG_Days\GenericBPEL2\Ge...
File Edit View Search Navigate Run Debug Refactor Versioning Tools Window Help
Applications
DecisionService.bpel
GenericBPELProcess2.bpel
GenericServiceBranch.bpel
Drill Down Stack:
JavaWebService1.v
MyWebService1.ws
Resources
GenericBPELXMLReader2
GenericServiceBranch
Integration Content
Schemas
GenericService
Test Suites
bpel.xml
GenericServiceBra
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Resources
OrderBookingTutorial_prod
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BPEL Structure
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Process - Generic
Properties
Property Aliases
Sensor Actions
Show Detailed Node Informat...
Source BPEL
Services
BAMWorkerProcess
CreditRatingService
client
main
receiveInput
Switch_Branching_Logic
replyOutput
GenericServiceBranch
Services
Diagram Source History
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BPEL editor
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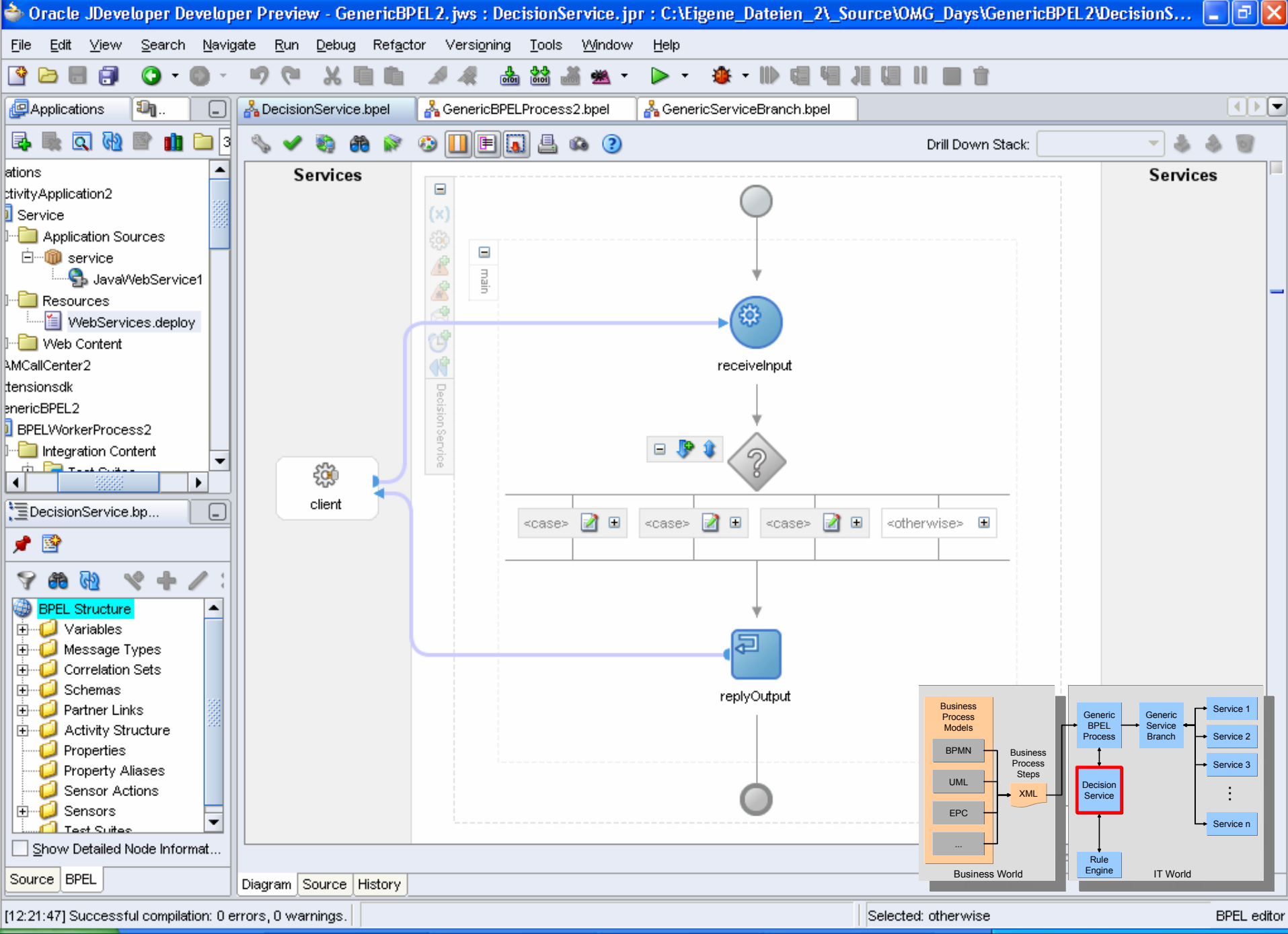
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File Edit View Search Navigate Run Debug Refactor Versioning Tools Window Help
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GenericBPELProcess2.bpel
GenericServiceBranch.bpel
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Services
Service
Application Sources
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Property Aliases
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Sensors
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Source
BPEL
main
DecisionService
client
receiveInput
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<case>
<case>
<otherwise>
replyOutput
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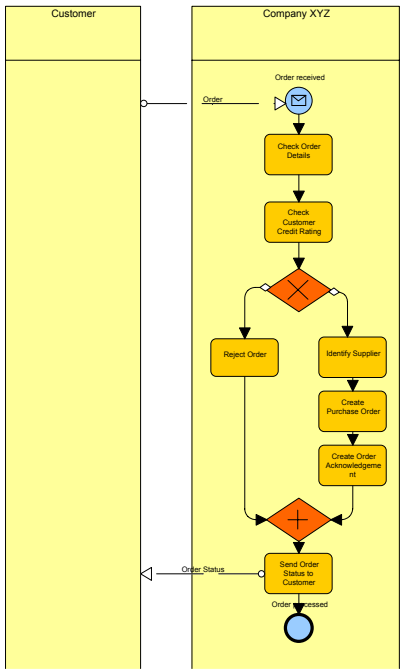
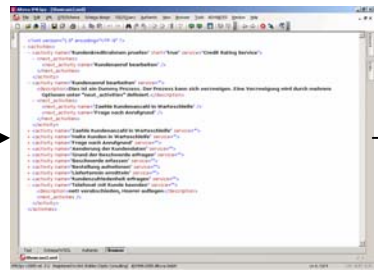
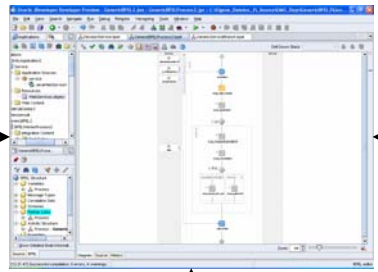


BPMN → BPEL
(Fragment)



BPEL



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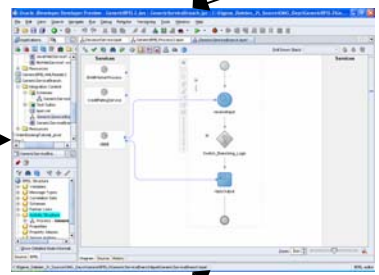

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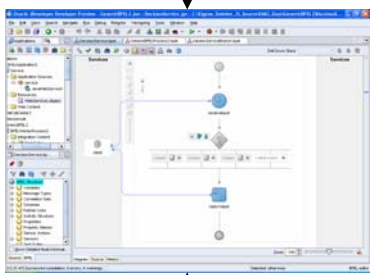

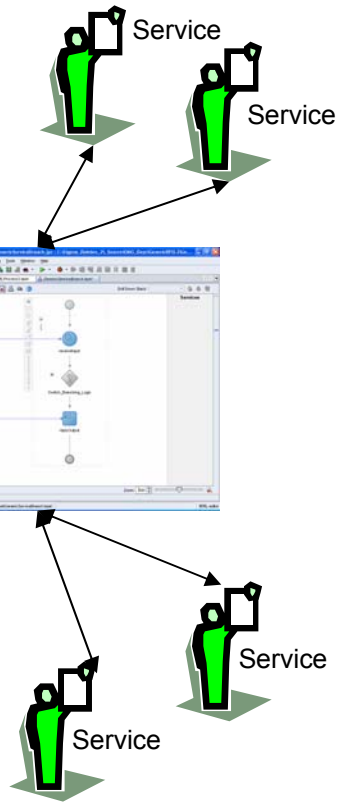

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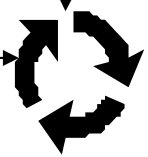

Rule Engine

- Benefit for the Business
  - Business specific modeling domain
  - Clear separation from technical content
  - Capability to use tools optimized for the business process design
  - Processes can be adjusted purely from the business view
    (prerequisite: correctly implemented and linked technical processes)

- Benefit for the IT
  - IT specific modeling domain
  - Clear separation from business content
  - Capability to use tools optimized for the IT design

- Usage Scenarios for this approach:
  - Environments with a high amount of automated backend processes
    - Financial Institutions
    - Telecommunication
    - Logistics
    - …
  - Environments with the demand to prepare information for different stakeholders
    - Process Documentation
    - Process Certification
    - Auditing
    - IT-Development
    - …

„If everything seems to be under control, you‘re just not moving fast enough“

(Mario Andretti – Race Driver)