

14.–17. 09. 2009  
in Nürnberg



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## Alles im Fluss

Ein Java-Framework für BPMN-basierte Geschäftsprozesse im SOA-Umfeld:  
von der Modellierung bis zur Ausführung

Volker Stiehl

SAP AG



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# Agenda



- 1. Introducing Composite Applications**
2. Introducing Business Process Modeling Notation
3. Introducing Investment Approval Process
4. Demo: Modeling Investment Approval Process
5. Summary

Composite Applications require a change in thinking from an architect's as well as from a developer's point of view.

Learn how to successfully build a composite application and apply the principles to your own projects!

## Definition of a Composite Application



**Wikipedia:** A Composite Application is an application built by combining multiple existing functions into a new application.

**Extended Definition:** Composite Applications are **user centric** applications supporting **highly collaborative** and **dynamic business processes** which **span** beyond functional, system, and organizational boundaries by using data and functions **provided as services** by platforms and applications.

# Manage Enterprise Business Processes

## Step 1: Application Core Processes

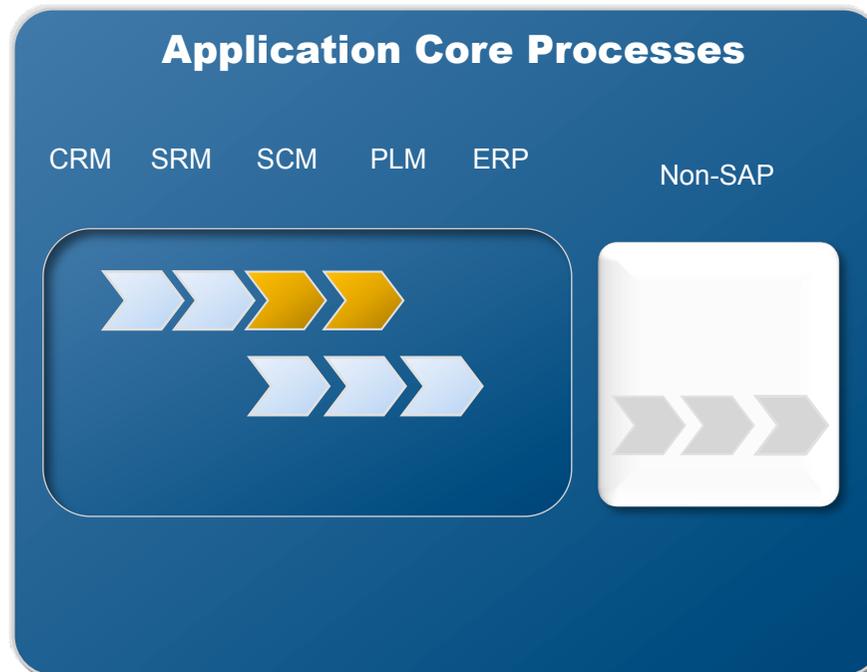


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- **Define & Standardize** core business processes
- Leverage packaged **Business Applications**
- Adopt service-enabled industry-specific **best practices**

Definition



# Manage Enterprise Business Processes

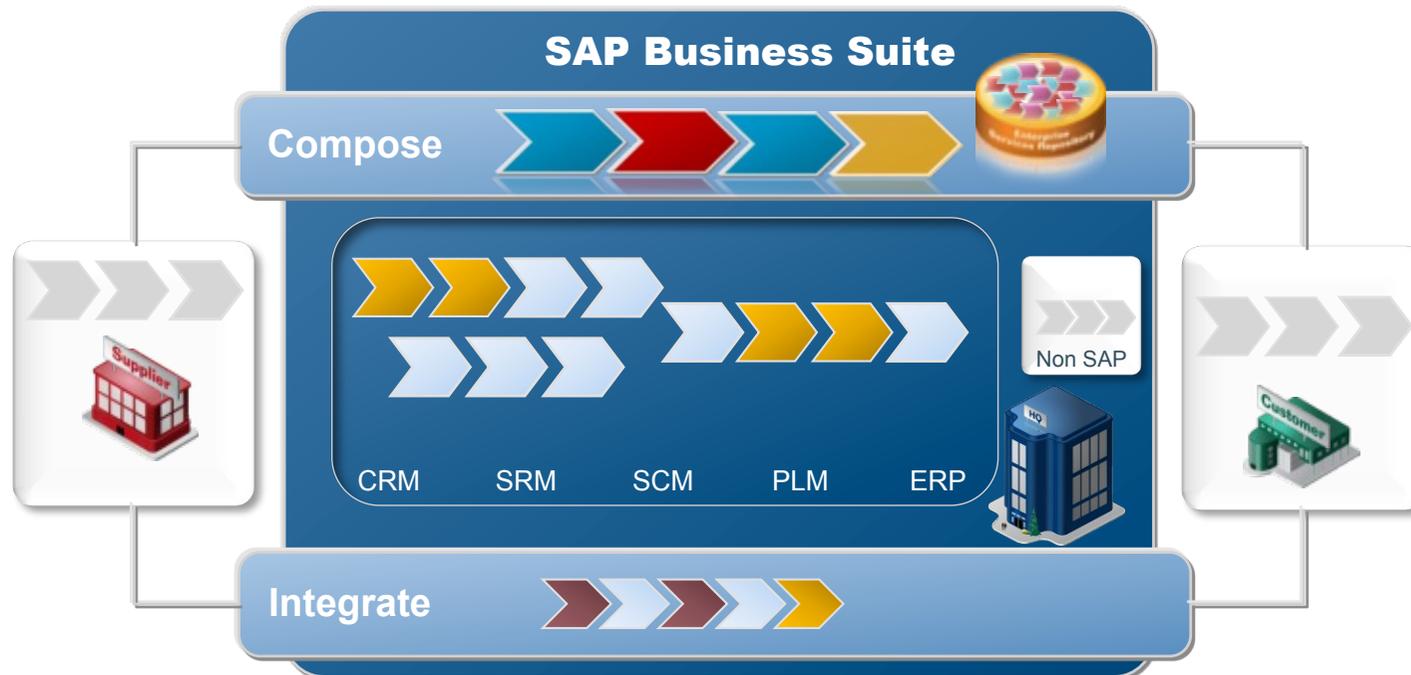
## Step 2: Composite Business Processes



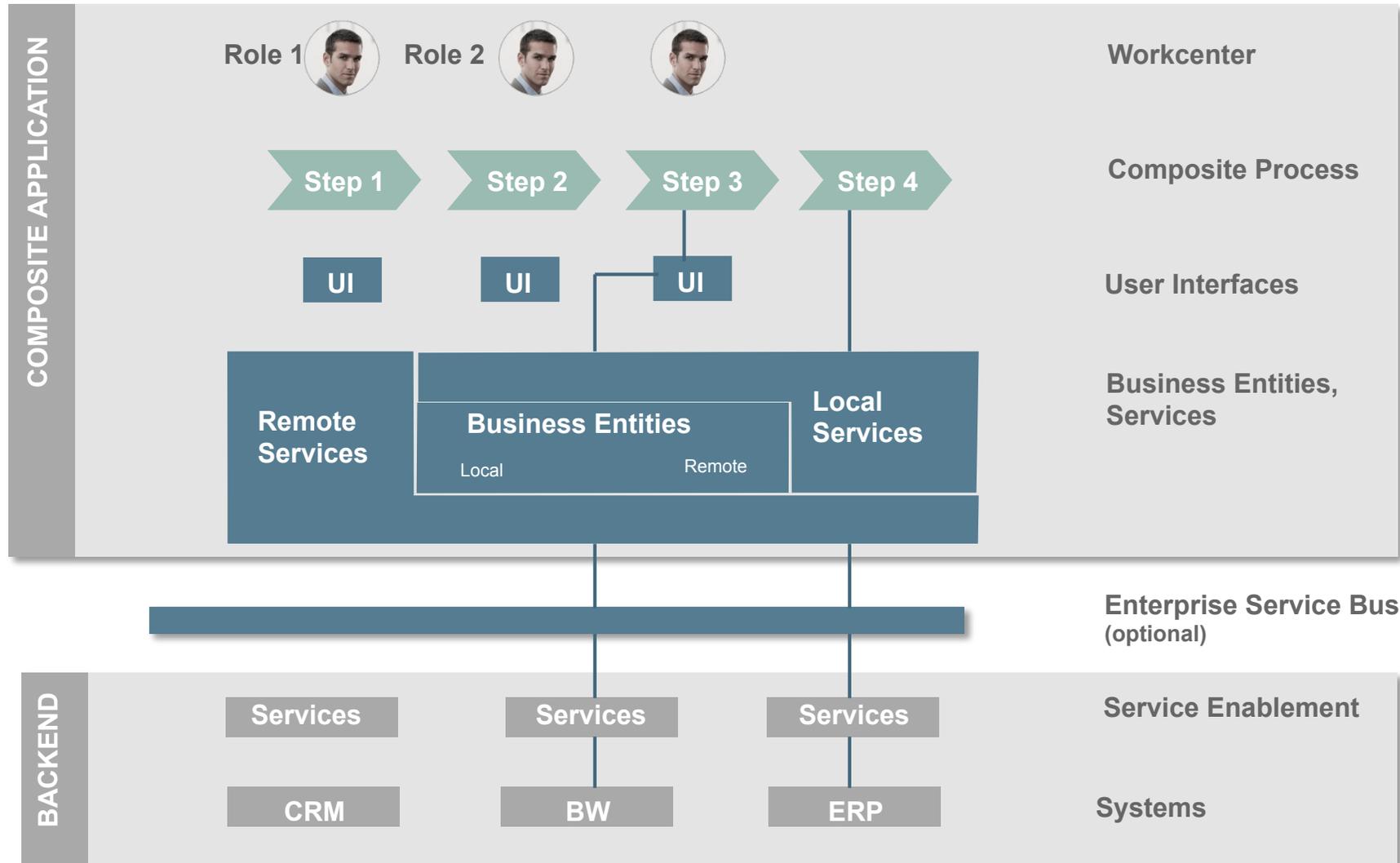
2

- **Compose** new innovative **business process extensions**
- **Integrate** and **extend** core business processes

Definition



# Anatomy of Composite Applications



# Agenda



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*“The primary goal of BPMN is to provide a notation that is readily understandable by all business users, from the **business analysts** that create the initial drafts of the processes, to the **technical developers** responsible for implementing the technology that will perform those processes, and finally, to the **business people** who will manage and monitor those processes. Thus, BPMN creates a standardized bridge for the gap between the business process design and process implementation.”*

*OMG, BPMN 1.1 Specification*

- First published in 2002
- Official standard of the Object Management Group (OMG) since 2006
- Current Version: BPMN 1.2

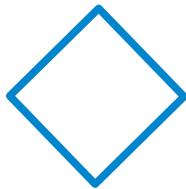
# Business Process Modeling Notation – Sequence Flow Overview



Activity

## Activity:

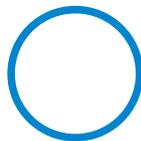
- A step in the process
- Represents work or action to be performed



Gateway

## Gateway:

- Controls flow branching, merging and parallel actions
- Pure logic – does not do the decision itself



Event

## Event:

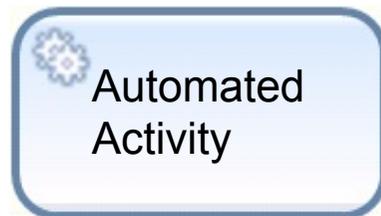
- A signal that „something has happened“
- Can start, pause and resume or interrupt and redirect a process or activity

# Business Process Modeling Notation - Activities



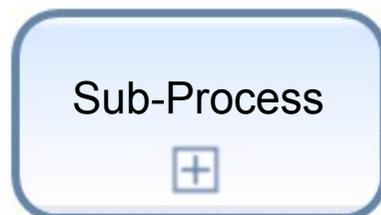
## Human Activity:

- Activity that has to be processed by a natural person



## Automated Activity:

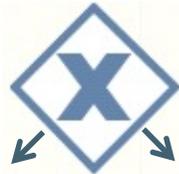
- Activity that is processed by a system



## Sub-Process:

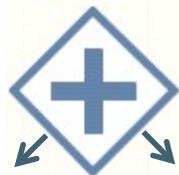
- A compound (decomposable) activity that holds a sub-process modeled with BPMN – can be shown collapsed or expanded

# Business Process Modeling Notation - Gateways



## Exclusive Choice:

- Only one path can be taken
- Each gate has a boolean data expression



## Parallel Split (also AND gateway):

- Splits sequence flow in parallel stream



## Event based Choice:

- Only one path can be taken
- Decision is based on events, not data condition



## Uncontrolled Merge:

- Merge exclusive alternative incoming sequence flows to one outgoing sequence flow



## Parallel Join:

- Merge parallel alternative incoming sequence flows to one outgoing sequence flow

# Business Process Modeling Notation – Events



## Start Event:

- Creates new process instance or indicates start of a sub-process



## Intermediate Timer Event:

- pause the sequence flow of a process or a sub-process for/ until a specific time



## Intermediate Message Event:

- Wait for and receive a message



## Intermediate Error:

- Aborts activity on error



## End Event:

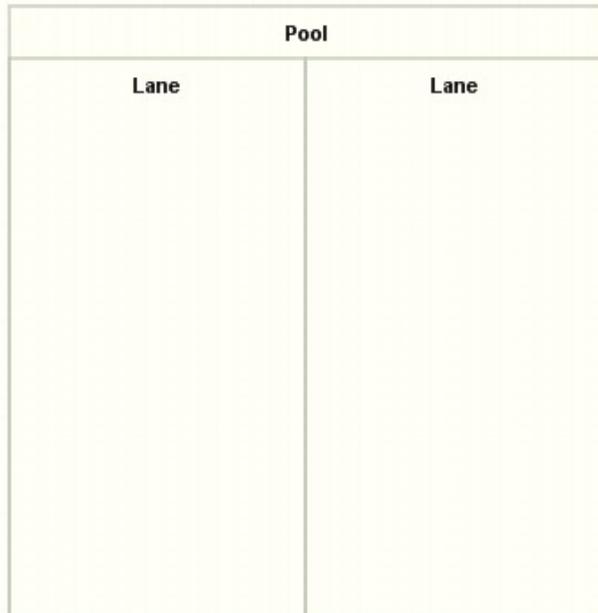
- Ends a sequence flow in a process or a sub-process



## Termination:

- Stop the process or sub-process immediately

# Business Process Modeling Notation - Orchestration and Choreography



## Pool:

- A Pool contains a single „BPMN- Process“
- A sequence flow is constrained in exactly one pool
- A Process diagramm may contain several pools
- Differentiation between „active“ and „inactive“ (descriptive) pools
- Only one active pool per model
- A pool generally represents a logical collection of roles, organizational units and systems

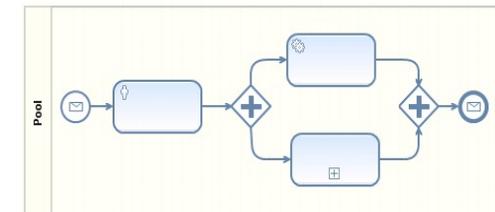
## Lane:

- A pool may be divided into lanes
- A lane generally represents a role or an organizational unit



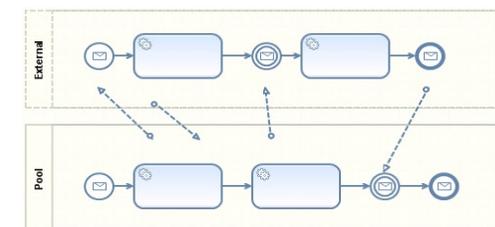
## Orchestration:

- Modeling a process **flow of control** in a single internal (active) pool
- Representation as **sequence flow**



## Choreography:

- Modeling interaction between pools (not flow of control!)
- Representation as **message flow**



# Business Process Modeling Notation (BPMN) - Artifacts



## Artifacts:

- Besides the modeling of the process flow BPMN allows to model artifacts that hold additional information such as data templates that are processed within an instance of the process or annotations to comment and explain the process.



Data Object

## Data Object:

- An artifact that stores process context
- Accessible during whole process



Annotation

## Annotation:

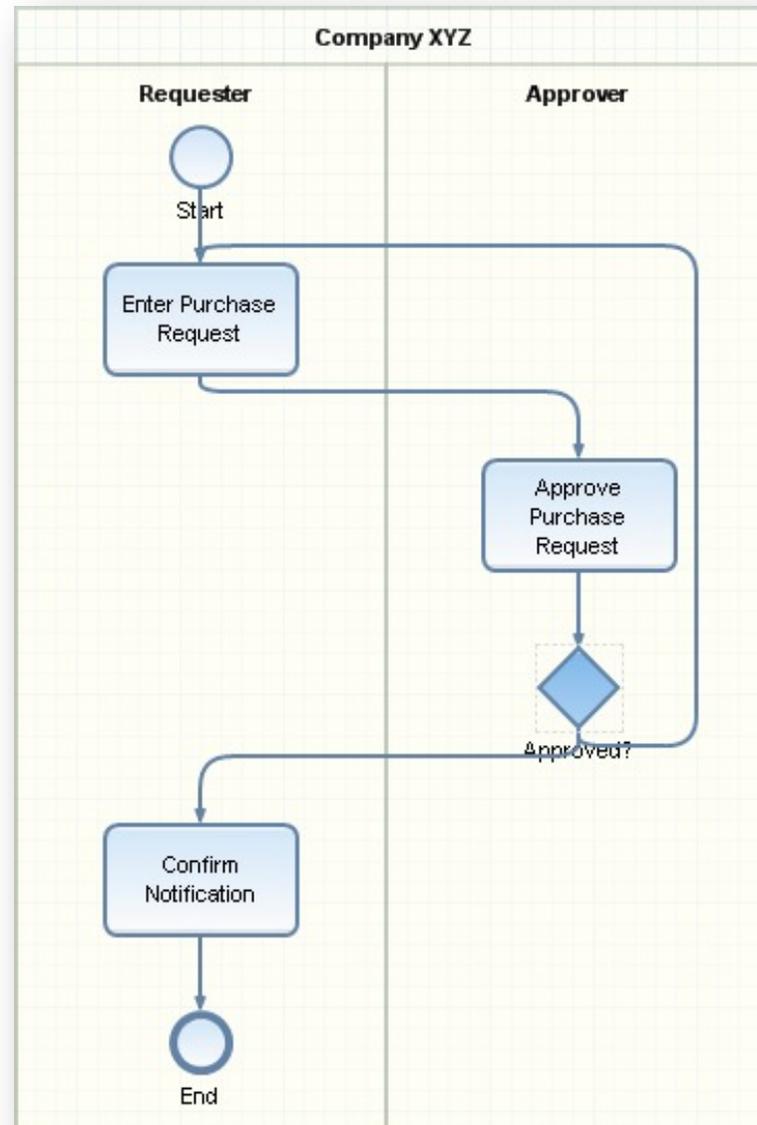
- Possibility to give comments within a process model
- Pure description

# Agenda

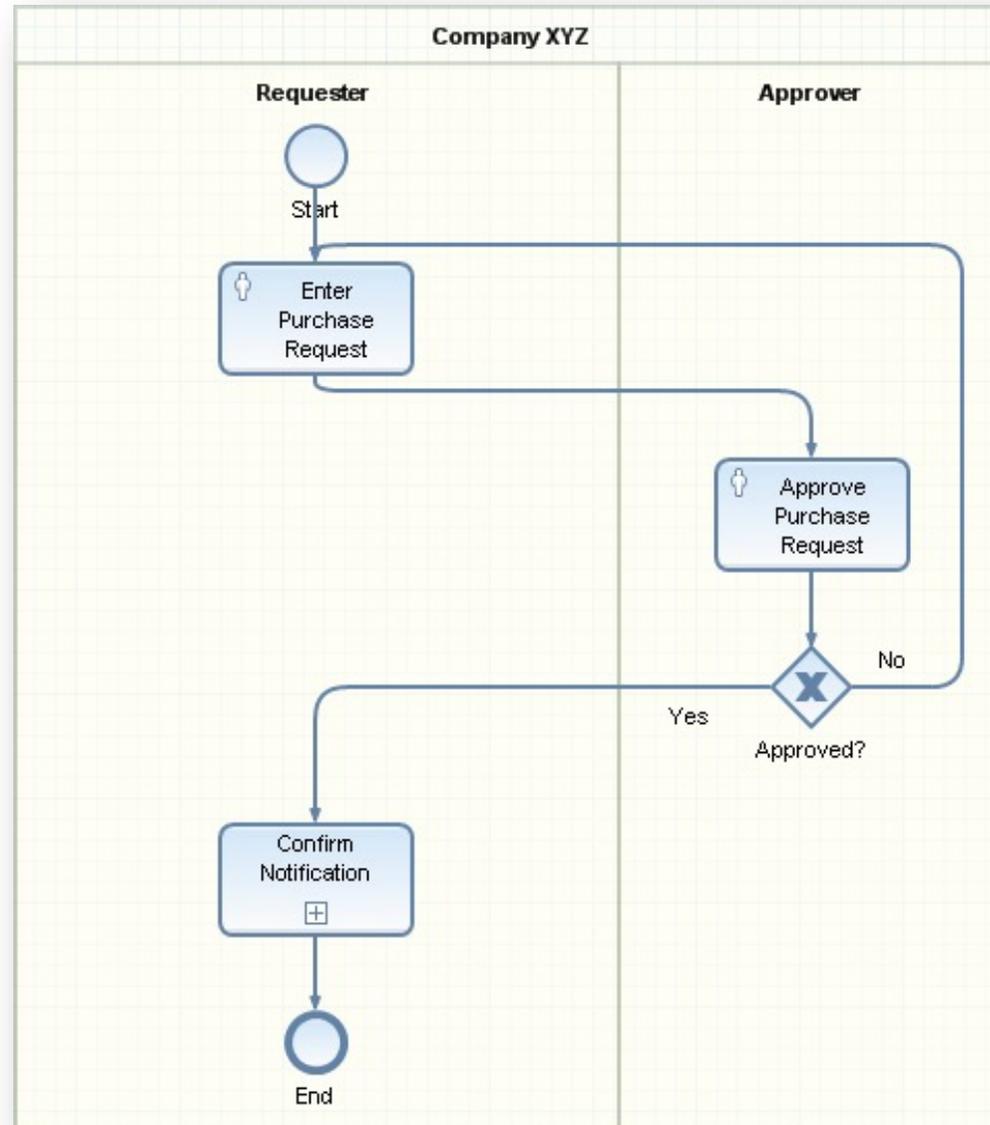


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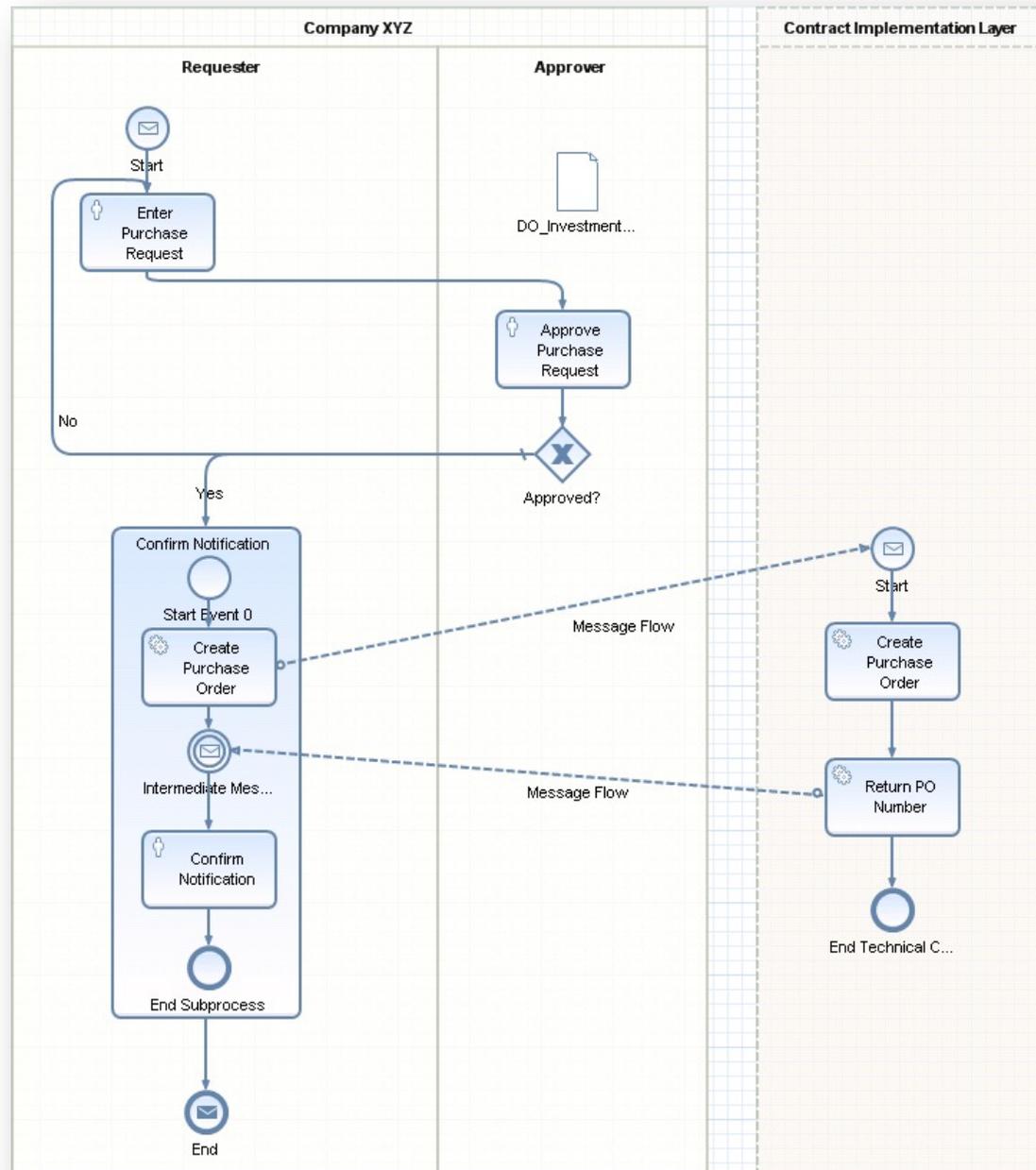
# Example – Business Expert View



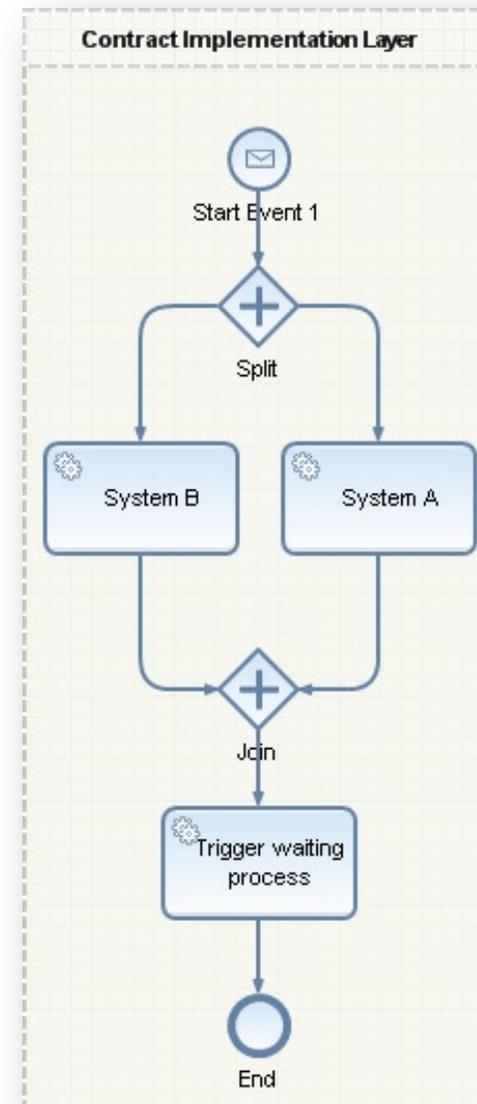
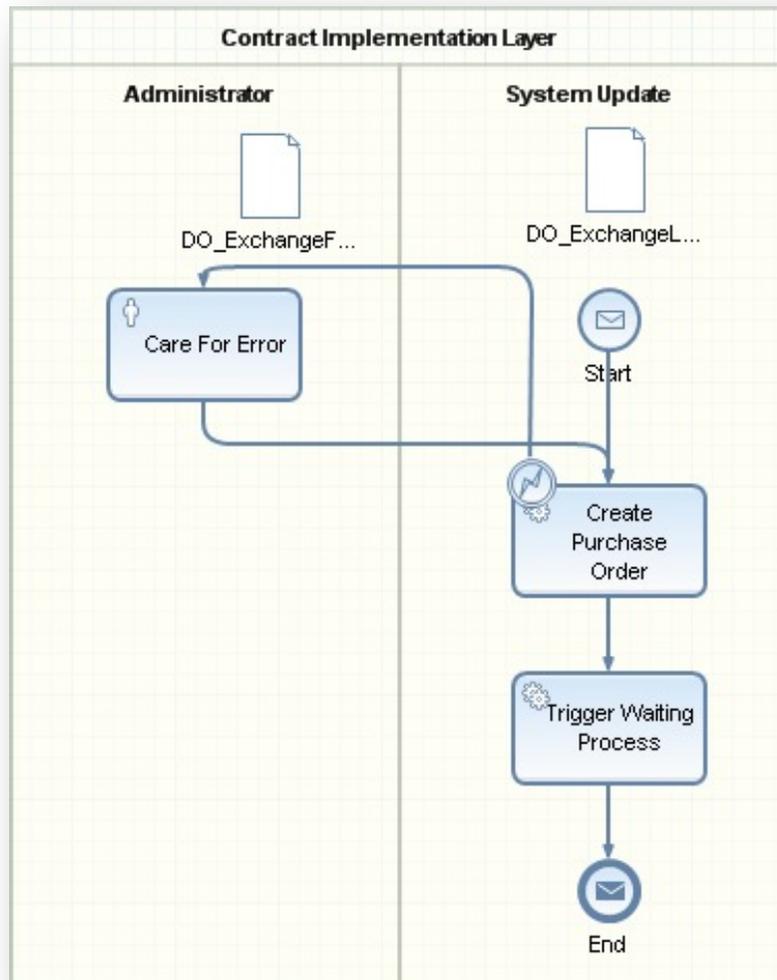
# Example – Developer View (1)



# Example – Developer View (2)



# Example – Developer View (3) Technical Composition



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**DEMO**

Modeling and Running the Investment Approval Process

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# Agenda



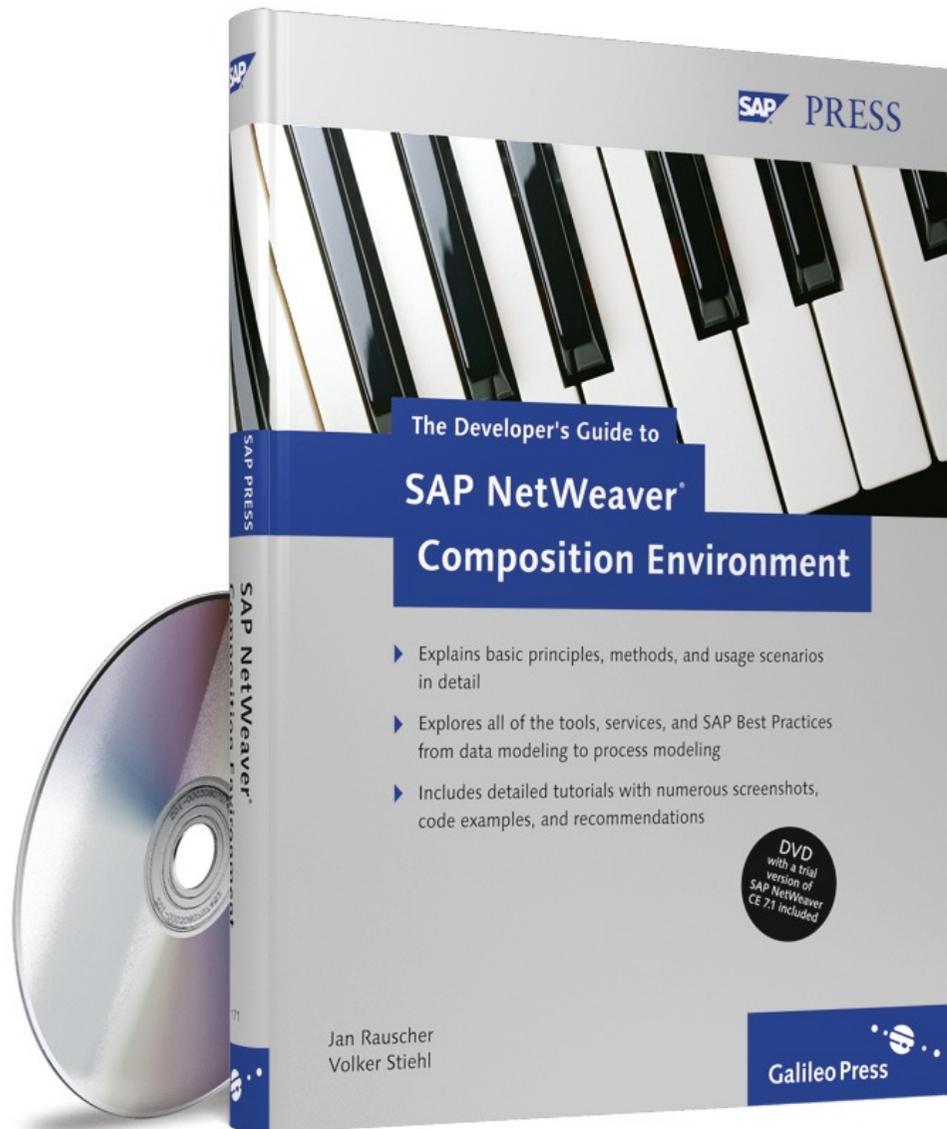
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# Summary – BPMN-based Processes in an SOA Environment



- BPMN builds the common foundation for the communication between the business and the IT world
- BPMN is suitable to model both - business as well as technical processes
- BPMN based processes can be made executable by adding technical details to the model
- BPMN is especially well prepared to support the implementation of well-structured SOA-based architectures (loose-coupling)
- BPMN-based frameworks will significantly improve developer efficiency

# Recommended Reading



Jan Rauscher, Volker Stiehl

## **The Developer's Guide to the SAP NetWeaver Composition Environment**

<http://www.sap-press.de/1671>

ISBN 978-1-59229-171-7

## **Programmierhandbuch SAP NetWeaver Composition Environment**

ISBN 978-3-8362-1129-1

<http://www.sap-press.de/1655>

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Vielen Dank!

Volker Stiehl

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