2. BPMN

2.1 Modellieren mit BPMN
Grundlage: Bruce Silver
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BPM Lifecycle: Where BPMN Fits

- KPIs (key performance indicators)
- Modeling
- Analysis
- Monitoring
- IT Refinement
- Deployment
- Execution

New in 2.0!
Process Modeling is Layered

Conceptual Process Model (BPMN)

Transform

Logical Process Model (BPEL)

Deploy

Process Engine
History of BPMN

- First draft proposed by bpmi.org in March 2004
  - bpmi.org was a consortium that attempted to standardize aspects of business processes
  - It ceased to exist because of the success of BPEL
- Adopted as by OMG in February 2006
- Version 1.1 adopted in January 2008
  - Fixed bugs in version 1.0
- Version 2.0 is on its way...
  - Main weaknesses will be fixed
    - Clear(er) operational semantics & metamodel
    - New features (choreographies, correlations, exchange format,...)
- This lecture is based on the BPMN specification version 2.0. If not stated explicitly, BPMN thus means BPMN 2.0
BPMN 2.0 vs. BPMN 1.1

- BPMN 2.0 is based on BPMN 1.1 but additionally contains:
  - An XML-based *interchange format* for BPMN models
  - Clean operational semantics and metamodel (connecting BPMN to OMGs MDA efforts)
    - The metamodel is one of the most important changes, hence the new name (see below)
- The graphical notation is mostly unchanged, except for some new event types
- New BPMN “Level”: executable BPMN

BPMN in 1.1: “Business Process Modeling Notation”
BPMN in 2.0: “Business Process Model and Notation”
Overview On All Graphical Artifacts

insgesamt 402 Elemente
BPMN 2.0: Level 1 By Example
Basic Order Process

- Thin circle represent a *start event*
- Thick circle at the end is called and *end event*
- Rounded rectangles represent *activities*
- Activities represent actions, specific work performed
  - distinct from functions (e.g. Order Handling) or state (e.g. Order Received)
  - Typically, activities are named in the form Verb-Noun

*Ist kein Imperativ!*  
Deutsch: Bestellung empfangen, Kreditwürdigkeit prüfen etc
Order Process with Exception Paths

- The “regular” path in the process is called the “happy path”, the flow that models exceptional behavior is called the “exception path”

- The diamond shapes are called *gateways*
  - Gateways represent branch points in the flow
  - The path taken is depended on some logical condition, e.g. “Is the buyers credit ok?” or “Are all ordered items in stock?”

- The process has two end states: Order Failed and Order Complete
Swimlanes indicate who a certain activity performs.

Swimlanes (or lanes) typically represent roles or organizational units.

They are drawn as subdivisions of the rectangle containing the process, the so called pool (e.g. “Order Process” in the example above).
Subprocesses

This is an expanded view of the “Fulfill Order” activity in the previous slide. It represents a subprocess, i.e. an activity that contains sub-parts of the flow that are again expressed by a flow.

A task in contrast is an activity that cannot contain sub-parts.

Note how the gateway following the expanded sub process is used to continue the flow in the parent process based on the end event that was reached.
Parallel Split and Join

- Pick Stock and Arrange Shipment are parallel tasks.
- This is indicated by the *parallel gateway*, sometimes also called AND-gateway.
- A parallel gateway *split* must be joined by a parallel gateway *join* again.
- Note that the default gateway (e.g. “In stock?” above) denotes an exclusive decision and thus cannot be used to fork or join parallel activities (deadlock!)
Collaborations

- External participants (e.g. the “Customer”) to a process are modeled as a pool
- These interact with the process by exchanging messages
- Interactions between participants (modeled by lanes) are indicated by *message flows* (e.g. “Failure Notice”)
- Message flows are drawn as dashed lines with unfilled arrowheads *between* two pools
  - Note that the regular *sequence flow* is drawn as a solid line *within* a pool
- The diagram in the previous slide is called a “Collaboration Diagram”, since additionally to the flow within a process, it shows how the process interacts with external participants
- **Caveat**: In BPMN 1.1 the pattern of message flows was called “Choreography”
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