

Process Modeling

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Lecture Overview

Overview

- Why Modeling?
- Process Development Roles
- Modeling Notations
- Workflow Modeling
- BPMN 1.1
- BPEL
- Resources

BPMN 2.0 Level I

- Object Classes
 - Activities
 - Events
 - Gateways
 - Connecting Objects
 - Artifacts
- Process Types
- Examples

Why Process Modeling?

1. Elegant way to express structure of a process
2. Visual models are **easily understandable by all participants** of the development cycle
3. Minimize the misunderstandings during the transformation **from analytical description** to the **executable implementation** of the process
4. Covers **nested structure** (sub-processes)
5. Covers inter-process/inter-system **interactions**
6. Pictures are fun

(Non Scientific) Experiment

Is model more elegant and expressive than free text?

1. Two teams of volunteers (three students in each team)
2. Team 1 gets text description and they have 3.5 minutes to read
3. Team 1 starts discussion and Team 2 goes away with the process in BPMN 2.0
4. Audience observes the quality of discussion
5. Team 2 starts discussion
6. Conclusion :)

Modeling Notations

- **BPEL**
 - technical modeling, very detailed
 - service orchestration, executable
 - human task extended by BPEL4People
- **BPMN 1.0 – 1.1**
 - analytical modeling, not tight with semantics, not executable
 - XPD L semantics
- **BPMN 2.0**
 - analytical modeling (Level 1,2)
 - defined semantic – executable (Level 3)

BPMN 2.0 Levels

- Level 1 (Structural)
 - Captures basic structure of a process
 - Business experts <=> analysts/developers
- Level 2 (Analytical)
 - More details of process behaviour (interactions, events, timing)
 - Process analysts <=> Process developers
- Level 3 (Executable)
 - Specifies all used services and activity tasks
 - "(Process developers <=> Process engine)"

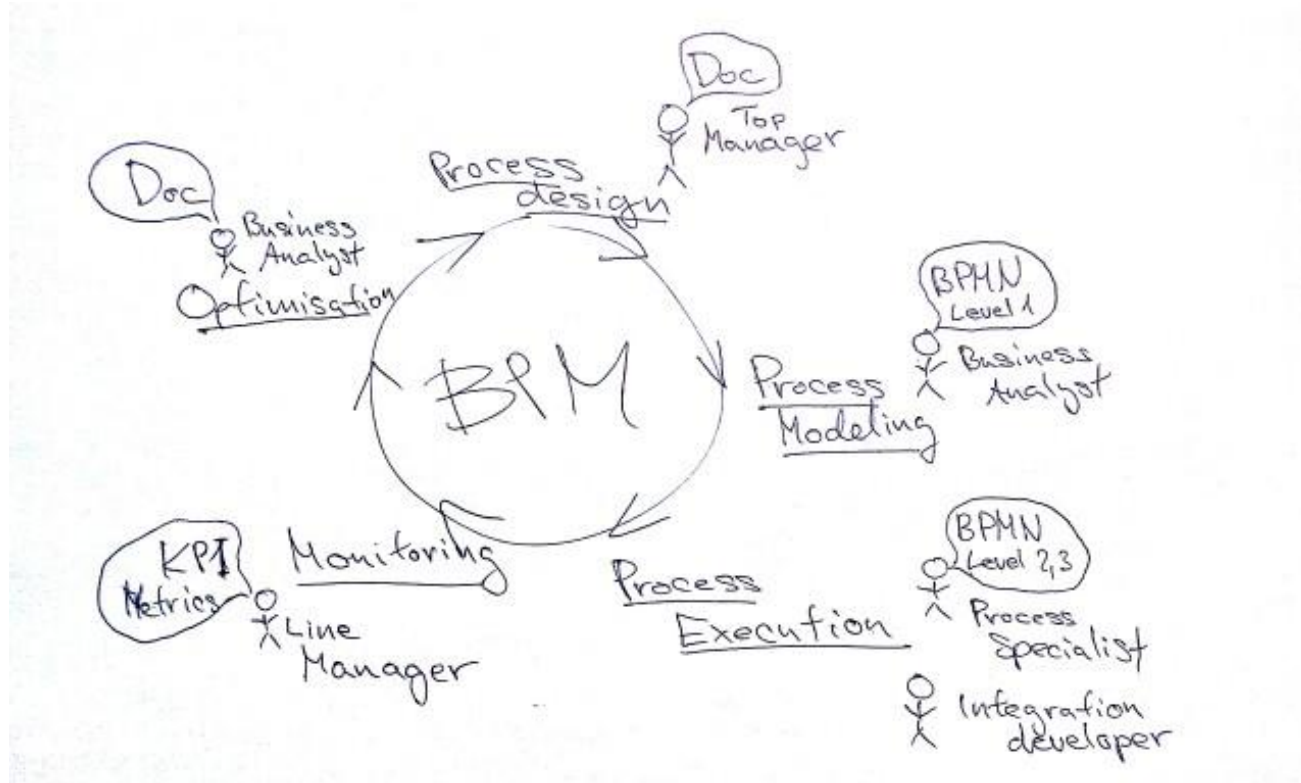
Model Quality Aspects

- **Validity against BPMN specification**
 - Wrong connections of the flow
 - Missing start/end
 - Wrongly used gateways
- **Model understandability**
 - Reasonable naming of activities
 - Reasonable amount of connections/gateways/activities
- **Expressiveness**
 - How it reflects the situation in real world
 - Granularity of activities
- **Compliance to the modeling best practices**
 - Modeling style (seminars & third modeling lecture)

Roles in Development Cycle

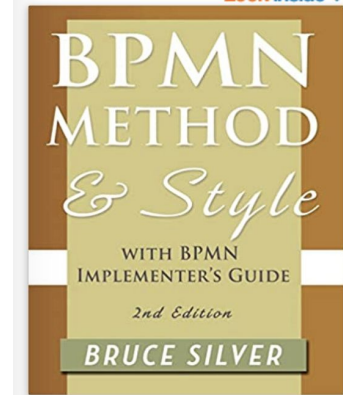
- **Business Analyst**
 - Sum business strategy
 - Describe goals & objectives, KPIs
 - Describe processes
 - Design BPMN diagrams (Level 1)
- **Process specialist**
 - Design BPMN diagrams (Level 1,2,3)
 - Design monitoring models
- **Process developer**
 - Detail BPMN Level 3
 - Implement services and deploy processes

Roles in Development Cycle



BPMN 2.0 Information Sources

- BPMN method and style Bruce Silver
 - ISBN 978-0982368114
 - Paperback \$30 / Online \$12 / Library \$0
- Signavio Modeler – Academic Licence
 - <http://academic.signavio.com/>
- BPMN Official OMG Website
 - <http://www.bpmn.org/>
- Business Process Modeling and Analysis
 - <https://open.hpi.de/courses/bpm2013>
- BPMN 2.0 Poster
 - http://www.bpmb.de/images/BPMN2_0_Poster_EN.pdf



Homework Assignments

- This week seminar
 - L1 homework assignment **deadline Monday 14th at 4PM**
- Next week seminar
 - You receive corrected homework
 - L2 homework assignment
- Homework submission
 - **PNG image or PDF document** exported from Signavio will be submitted to IS MUNI folder "Homework 1" named <surname>_bpmn.png , **before deadline**
 - Diagram has to be readable in a printed A4 paper size (it can be multiple pages if needed)

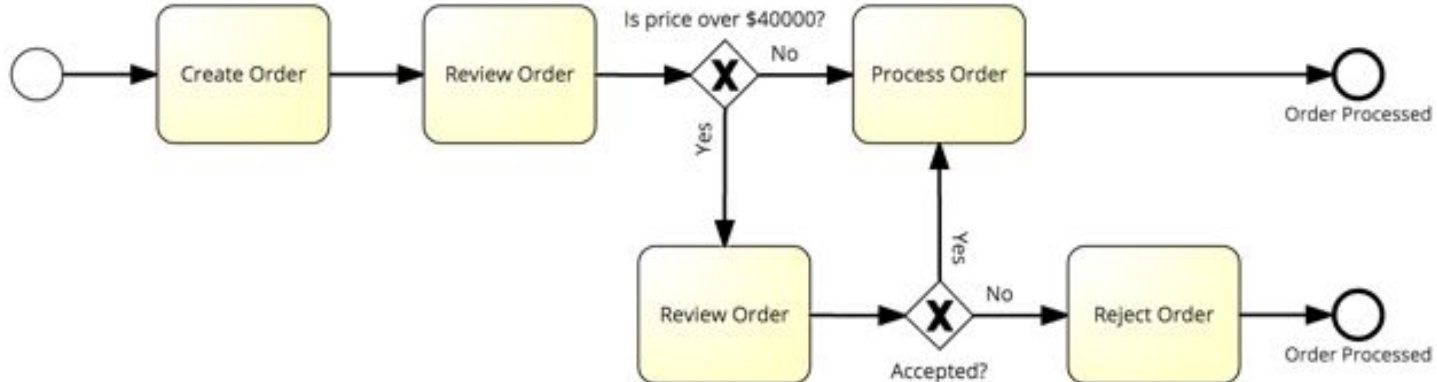
Questions?
Break 7mins

BPMN 2.0 Object Classes

- **Flow Objects**
 - Event
 - Activity
 - Gateway
- **Connecting Objects**
 - Sequence Flow
 - Message Flow
 - Association
- **Artifacts**
 - Group
 - Annotation
- **Swimlanes**
 - Pool
 - Lane
- **Data**
 - Data Inputs/Outputs
 - Data Stores

Process example

1. Customer **creates an Order**
2. **Order is reviewed** by Sales
 - 2.1. If price of the Order is **lower** than \$40 000, it is processed
 - 2.2. If price is **over** \$40 000 it have to be confirmed by Financial department
 - 2.3. Order can be rejected by the department
3. Otherwise the order is processed

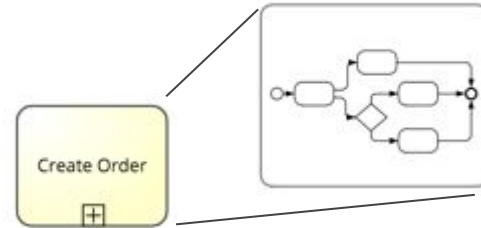


Activities

- Represent certain activity in the process
- Types of activity



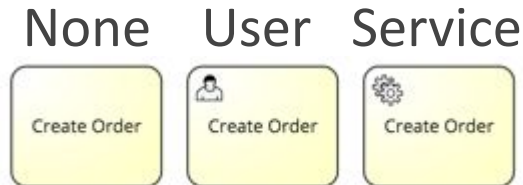
Task = Atomic activity



Subprocess = Complex activity

- Types of task

L1



L2



Events

- Represents event that occur in a process
- Have impact on process flow
- We have these L1 events:

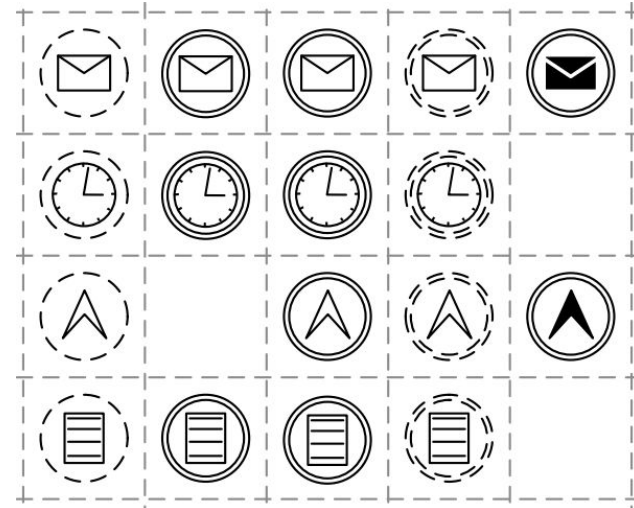
- Start






- End



L2

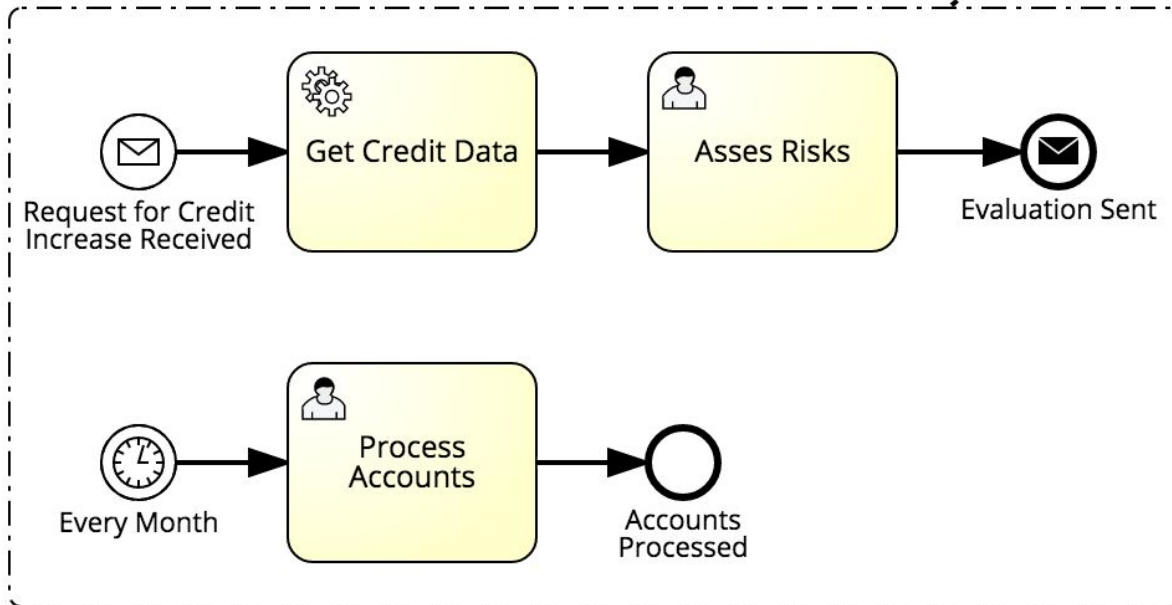


Connecting Objects

- Process sequence flow 
 - Define order of activities
- Message flow 
 - **Does not influence the process flow!**
 - Message flow between two objects
- Association 
 - **Does not influence the process flow!**
 - Connect objects with artifacts (labels, data objects..)

Basic Elements Examples

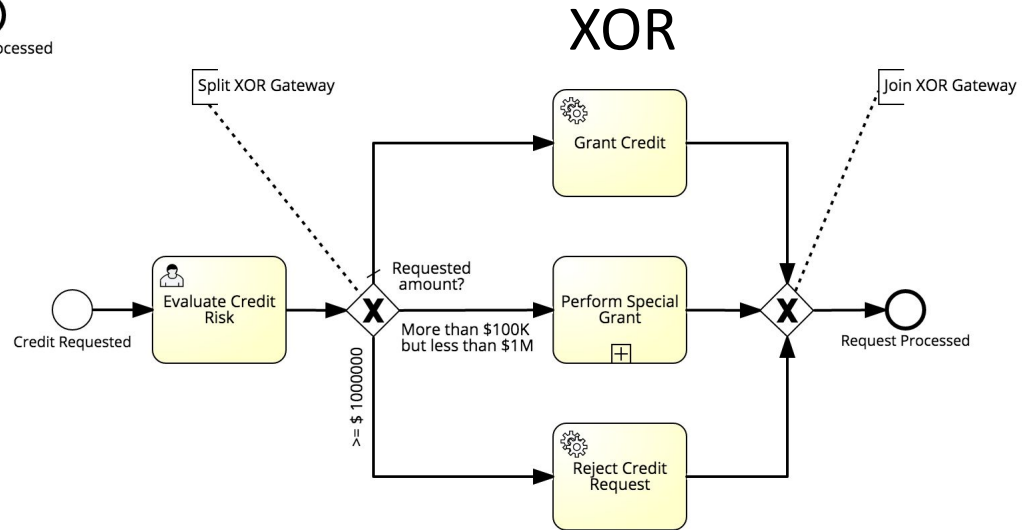
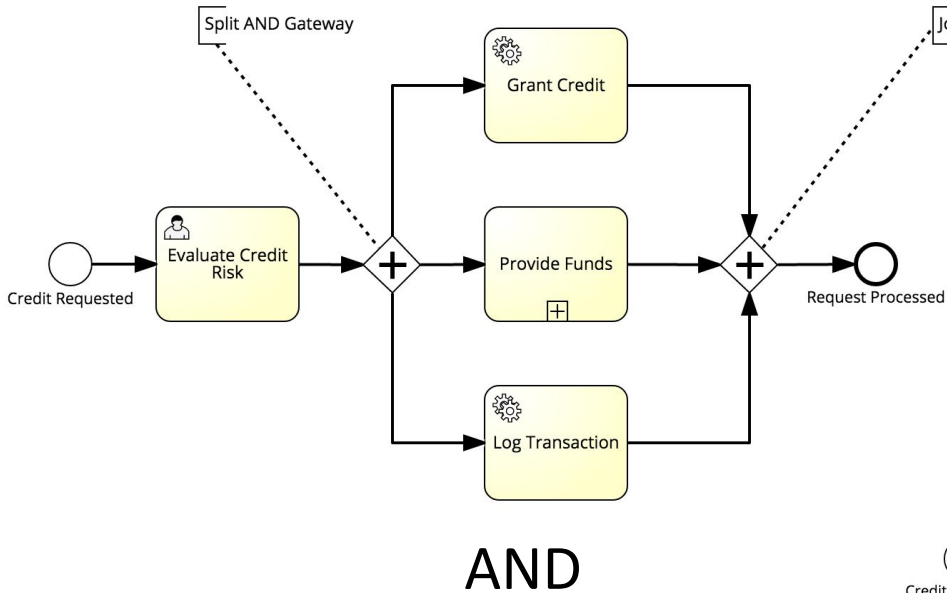
These processes are just examples



Gateway

- Represents a control point in the sequence flow
- Used for flow branching or join of branches
- We have these types:
 - ◆ **x Exclusive data-based (XOR)**
 - ◆ **+ Parallel**
 - **Default branch**
 - ◆ **★ Exclusive event-based (L2)**
 - ◆ **○ Inclusive (L2)**
 - ◆ *** Complex (L2)**

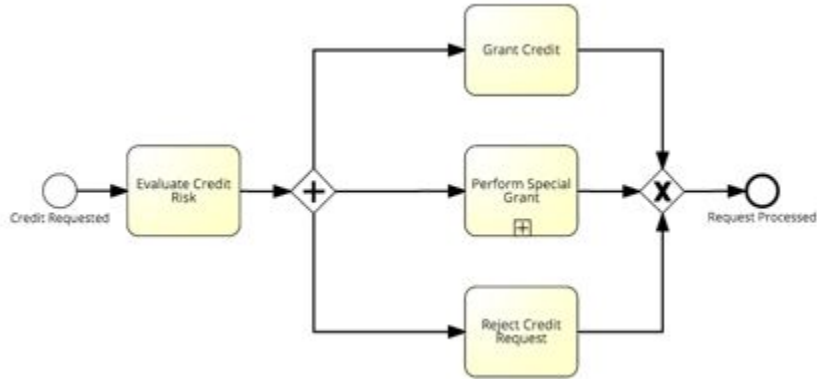
Gateway Examples I



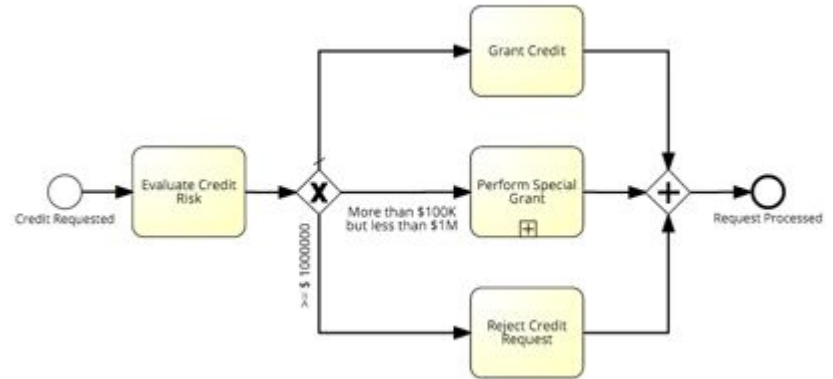
Gateway Examples II

(OK or NOK?)

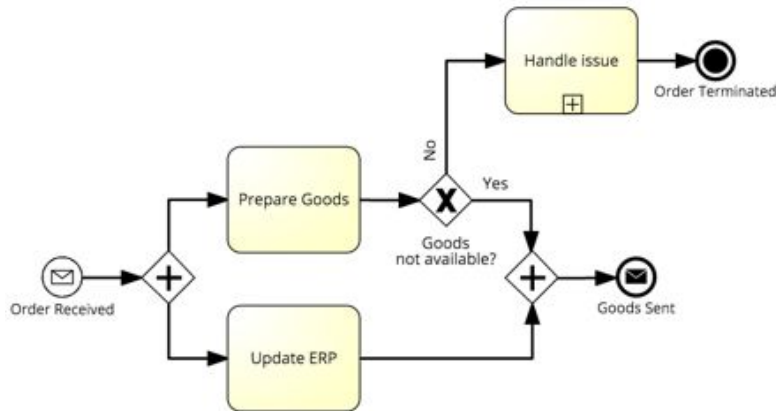
A



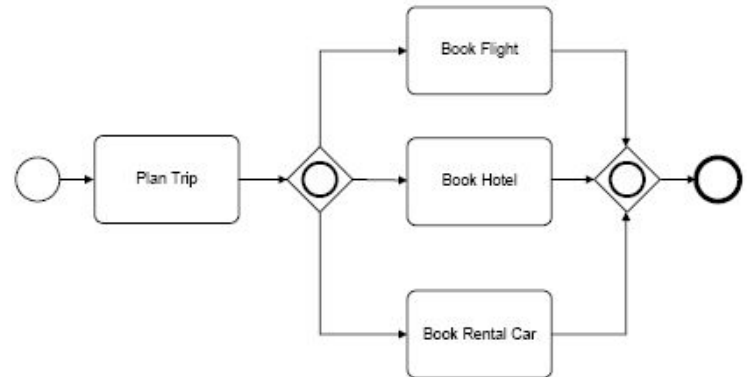
B



C



D

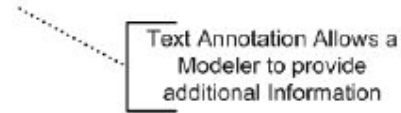


Artifacts

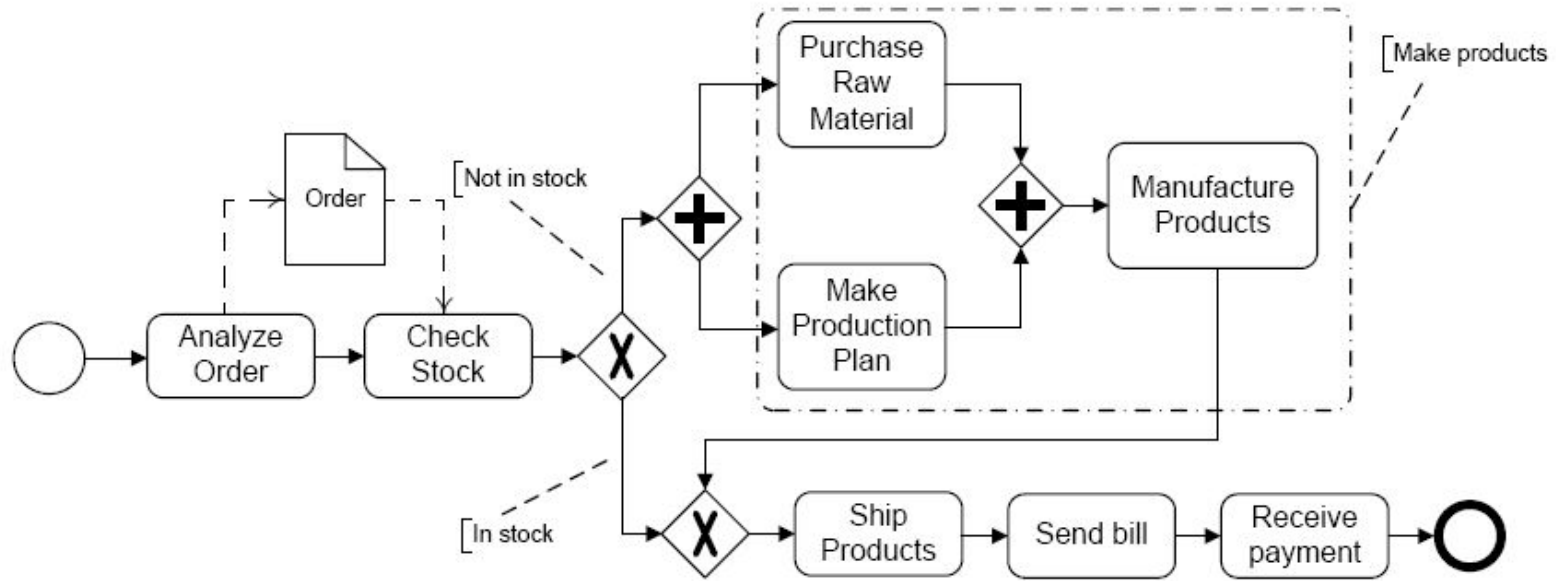
- Additional information
- Do not affect flow
- Data Objects
 - Data used in activities
 - Inputs and outputs of activities
- Annotation
 - Label, additional information
- Groups
 - Grouping of objects (analytical/documentation reasons)



Name
[State]



Artifacts Examples

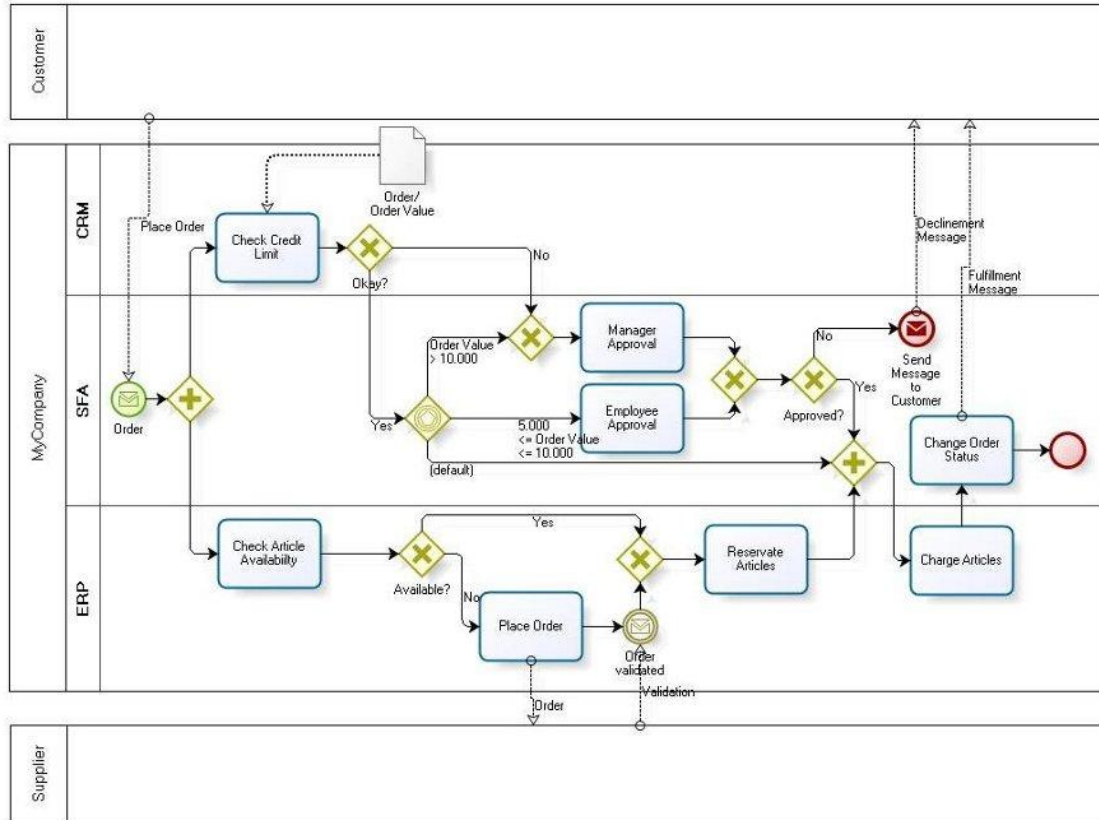


Pools & Lanes

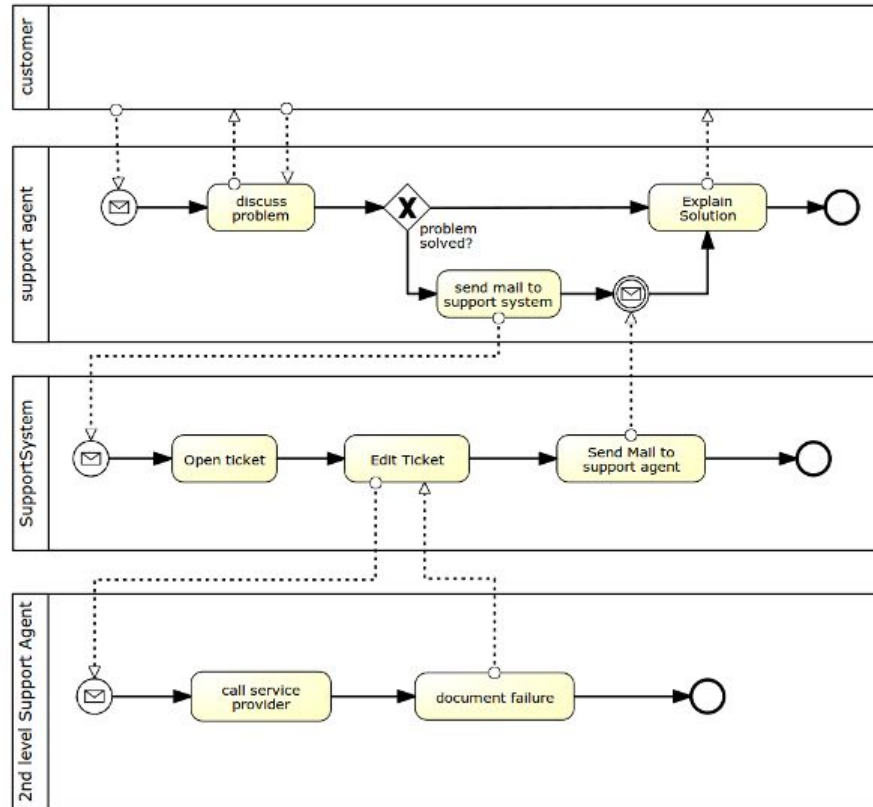
- Pool
 - Represent a participant in a process
 - Show message flows between participants
- Lane
 - Subdivision of pool
 - Express roles, departments or actors in a process



Pool Examples I

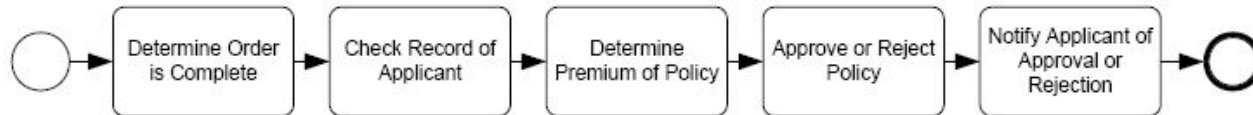


Pool Examples II



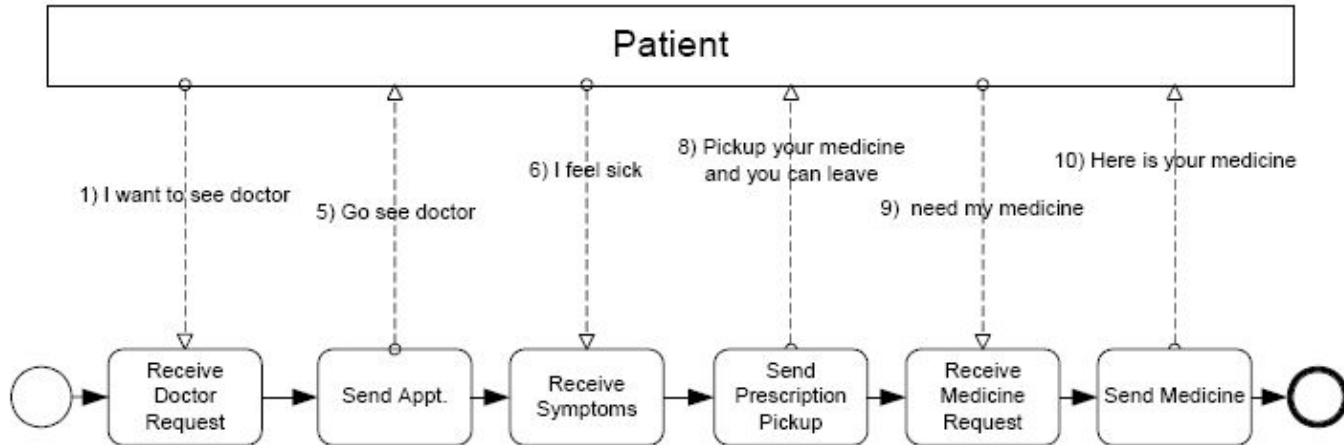
Private (Internal) Process

- From point of view of one organisation
- Activities are not visible to outside world
- One pool (the pool can be omitted)
- Also known as orchestration of services



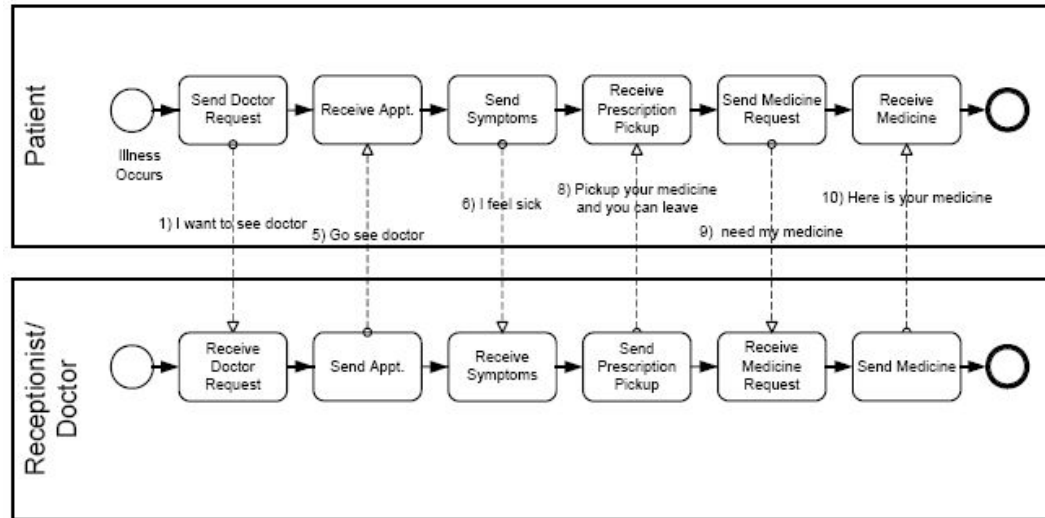
Abstract (Public) Process

- Represents the interactions between a private Process and another Process/Participant
- Only activities that send/receive messages
- Communication visible to outside world



Collaboration (Global) Process

- Collaboration between business entities
- Activities represent message exchange
- Public process are shown, corresponding private processes have much more activities and detail



Level 1 Palette

- Pool and Lane
- Task (User, Service, Abstract/None)
- Subprocess (Collapsed, Expanded)
- Start Event (None, Message, Timer)
- End Event (None, Message, Terminate)
- Gateway (Parallel, Exclusive)
- Sequence Flow
- Message Flow
- Data Object (Data store, Message)
- Text Annotation

FIN

Questions?

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