



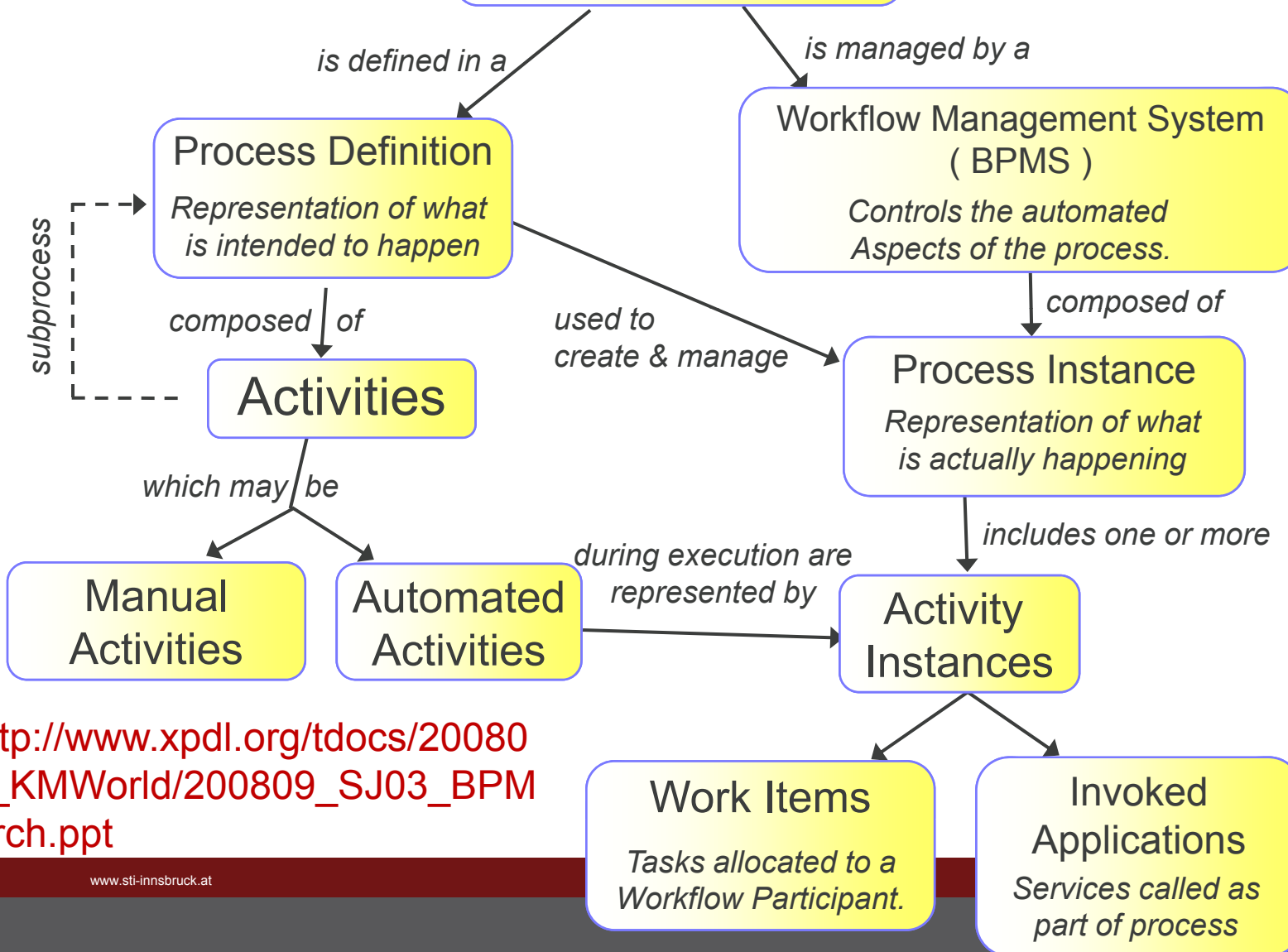
- A process model is a description of a process. Process models are often associated with business processes.
- A business process is a collection of related, structured activities that produce a service or product that meet the needs of a client.

- **Business Process Modeling (BPM)** is the activity of representing processes of an enterprise, so that the current ("as is") process may be analyzed and improved in future ("to be").
- BPM is typically performed by business analysts and managers who are seeking to improve process efficiency and quality.



# Business Process

*What is intended to happen*



[http://www.xpdl.org/tdocs/200809\\_KMWorld/200809\\_SJ03\\_BPM\\_Arch.ppt](http://www.xpdl.org/tdocs/200809_KMWorld/200809_SJ03_BPM_Arch.ppt)

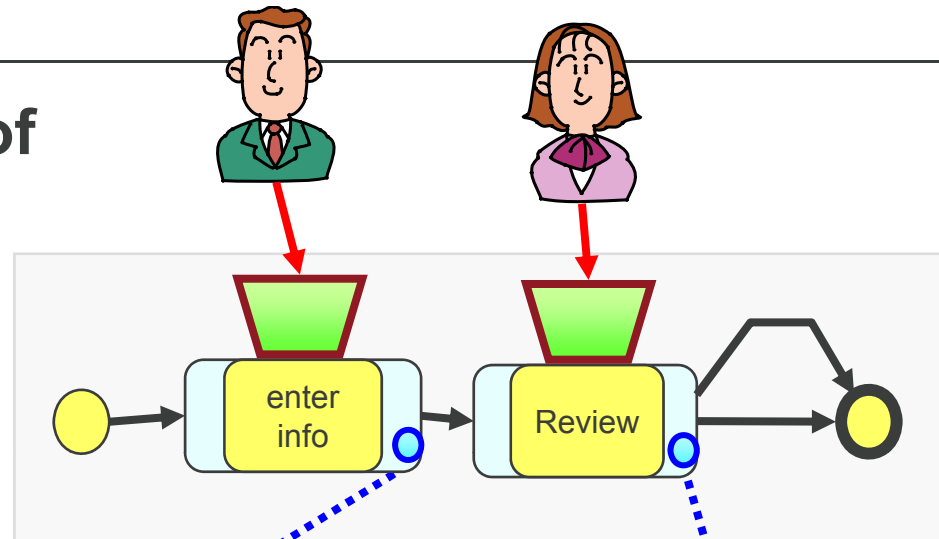
- How do we **design** and **communicate** this process?
- How do we **perform** this process **well**?
- How do we **manage** this process **well**?
- How do we maintain **compliance** to rules and regulations?
- How should **technology** support this process?

[http://www.xpdl.org/tdocs/200809\\_KMWorld/200809\\_SJ03\\_BPMArch.ppt](http://www.xpdl.org/tdocs/200809_KMWorld/200809_SJ03_BPMArch.ppt)

# Separation of Responsibility

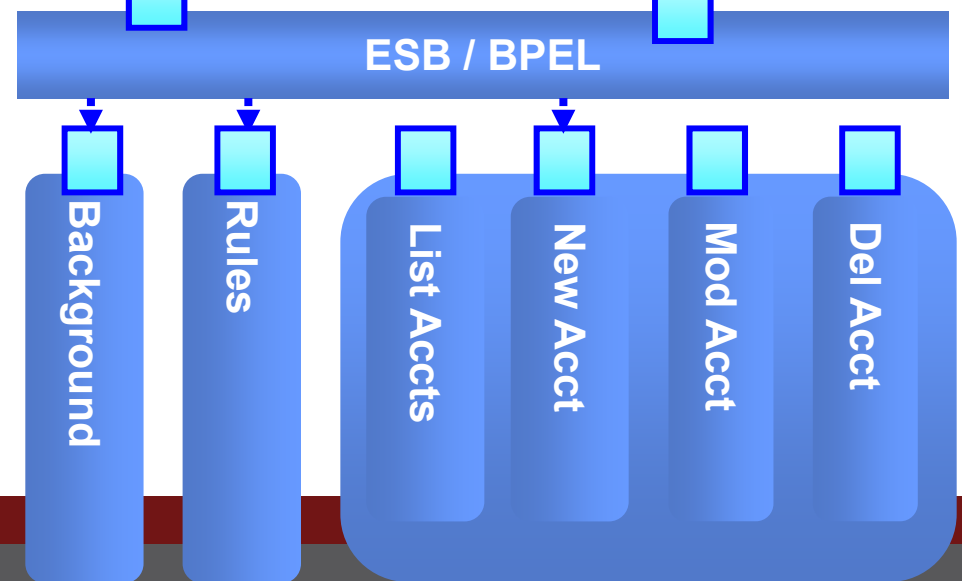
## Business Retains Control of

- Assignment of Responsibility
- Groups, Roles, Skills
- Deadlines
- Alerts, Reminders, Escalations
- Order of Tasks
- Addition of Manual Tasks
- User Interface



## IT Retains Control of

- Computational Logic
- Data Representations
- Scalability / Performance
- Interoperability
- Master Data Management



# Separate Development

## Business Retains Control of

- Assignment of Responsibility
- Groups, Roles, Skills
- Deadlines
- Alerts, Reminders, Escalations
- Order of Tasks
- Addition of Manual Tasks
- User Interface

Depends strongly on who is in each organization.

Changes on daily basis

Organizational Culture

Optimize for each team

Respond to market or legislation

Related to Training, Experience

---

## IT Retains Control of

- Computational Logic
- Data Representations
- Scalability / Performance
- Interoperability
- Master Data Management

Very low or no dependence upon the organizational culture

Requires expensive technical capabilities

Knowledge of infrastructure



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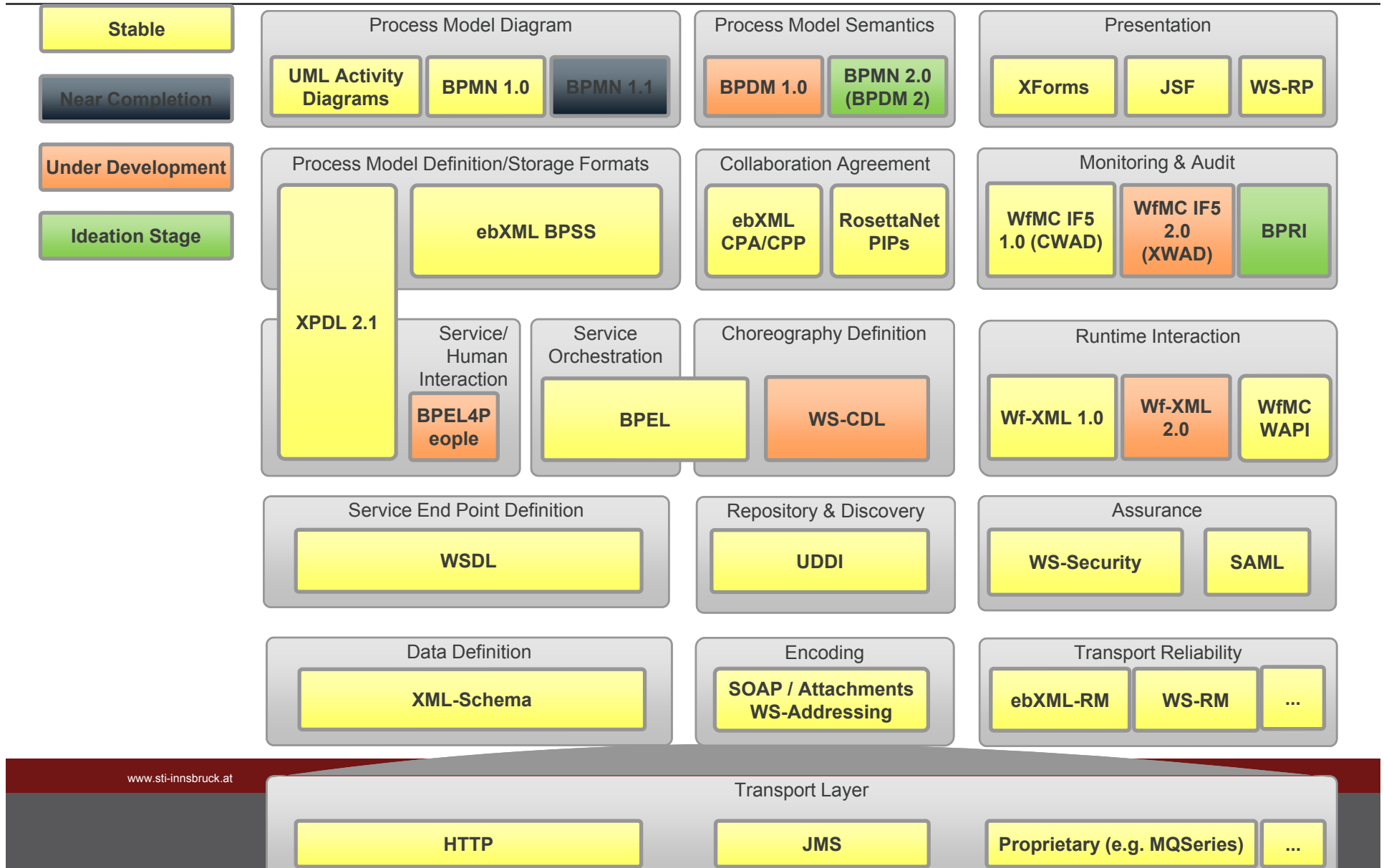
# Standards

[http://www.xpdl.org/tdocs/200809\\_KMWorld/200809\\_SJ03\\_BPMArch.ppt](http://www.xpdl.org/tdocs/200809_KMWorld/200809_SJ03_BPMArch.ppt)



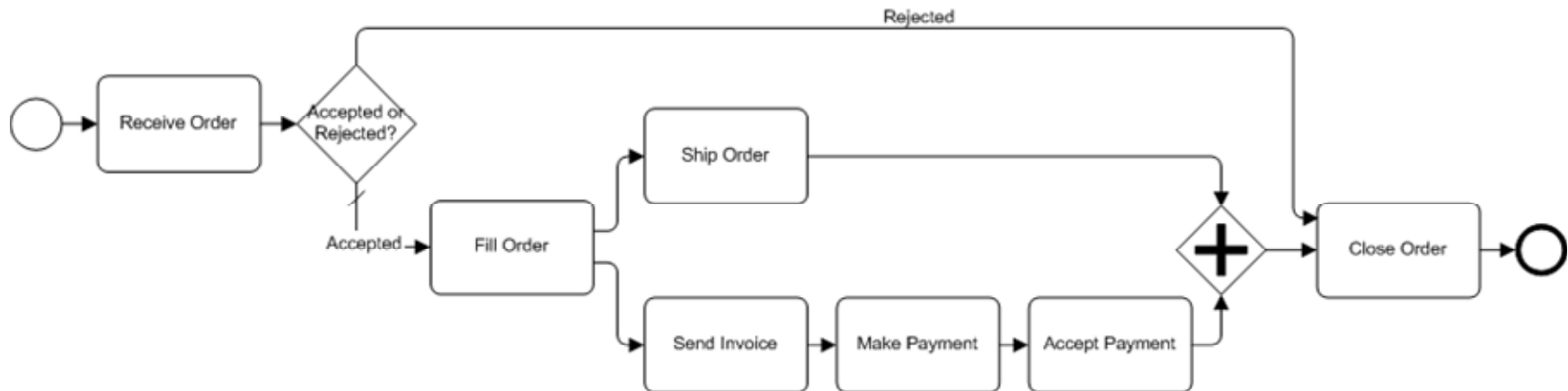
- **BPMN** – Business Process Modelling Notation  
widely accepted as standard for the *look* of a process
- **XPDL** – XML Process Definition Language  
promotes the exchange of processes between vendors and tools:
  - Modelling and Simulation
  - Process Design and Implementation
  - Process Deployment
  - BAM and Historical Reporting
- **BPEL** – Business Process Execution Language  
includes only the executable aspects of a process
  - Oriented toward orchestration of Web Services
- **Wf-XML** - Inter Engine Collaboration  
provides runtime integration between process services
- **BPAF** - Business Process Analytics Format  
provides standard event format for Process Intelligence Tools

# Standards Landscape



# BPMN: Business Process Modeling Notation

- Defines the way the process LOOKS



- Provides a dictionary of standard shapes with particular meanings
- Consistent use of shape/meaning benefits everyone
  - reduces the learning curve,
  - training on shapes is useful for multiple products

- Activities ~ work that is performed within a business process (represented by a rounded rectangle).
- Events ~ something that happens during the course of a business process which affects the sequence or timing of activities of a process (represented as small circles with different boundaries to distinguish start events (thin black line), intermediate events (double line) and end events (thick black line)).

- Gateways ~ control how sequence flows converge and diverge within a process. Gateways can represent decisions, where one or more paths are disallowed, or they can represent concurrent forks.
- Sequence flows. A sequence flow is used to show the order in which activities are performed within a process. A sequence flow is represented by a line with a solid arrowhead.

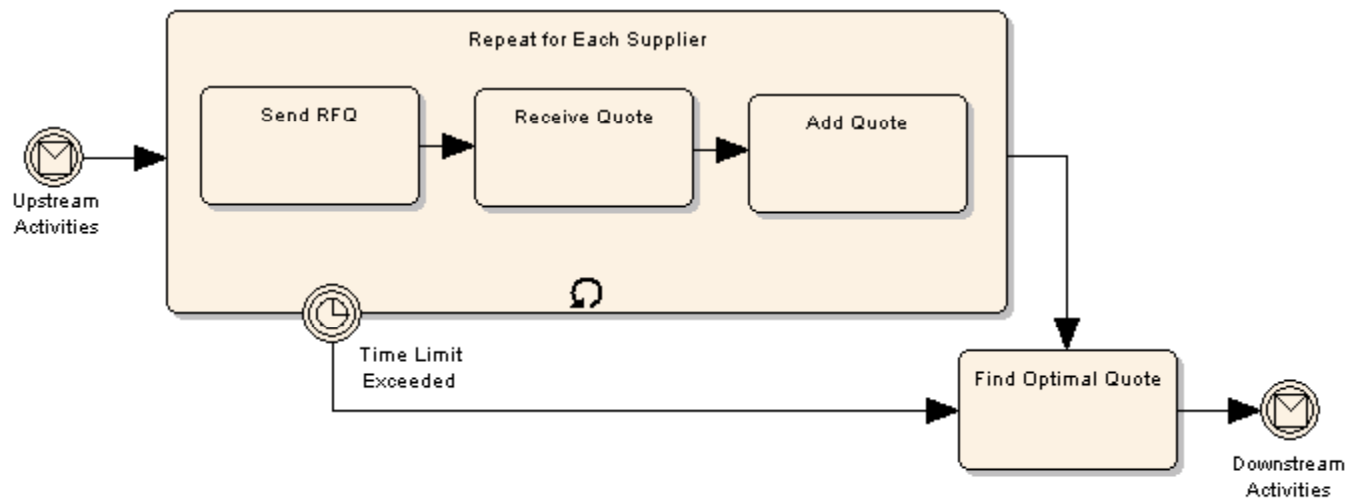
- Message flows. A message flow is used to show the flow of messages between two entities, where pools are used to represent entities. A message flow is represented by a dashed line with a light-colored circle at the source and arrowhead at the target.
- Associations. An association is used to associate information and artifacts with flow objects. An association is represented by a dashed line which may or may not have a line arrowhead at the target end if there is a reason to show directionality.

- Pools. A pool represents a participant in a process, where a participant may be a business entity or role. It is represented as a partition of the process.
- Lanes. A lane is a sub-division of a pool and is used to organize and categorize activities within the pool.

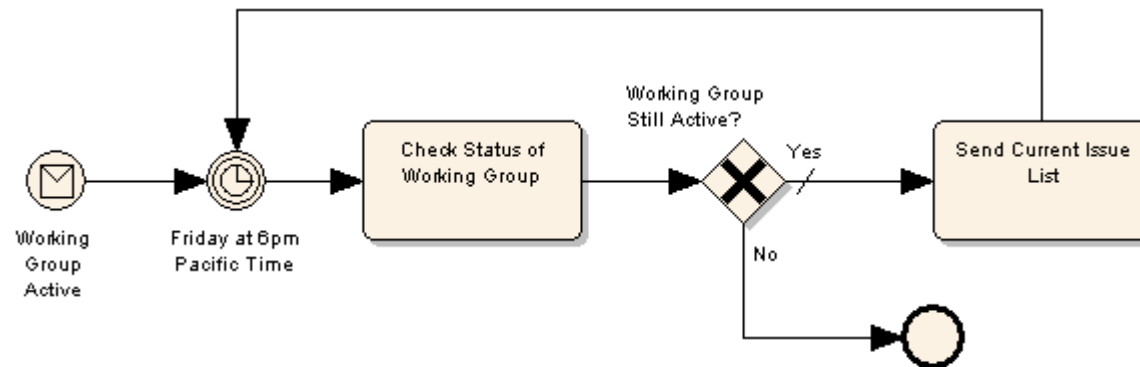
- Data objects. A data object does not have a direct affect on a process but does provide information relevant to the process. It is represented as a rectangle with the top corner folded over.
- Groups. A group is an informal means for grouping elements of a process. It is represented as a rectangle with a dashed line border.
- Annotations. An annotation is a mechanism for the BPMN modeler to provide additional information to the audience of a BPMN diagram. It is represented by an open rectangle containing the annotation text.



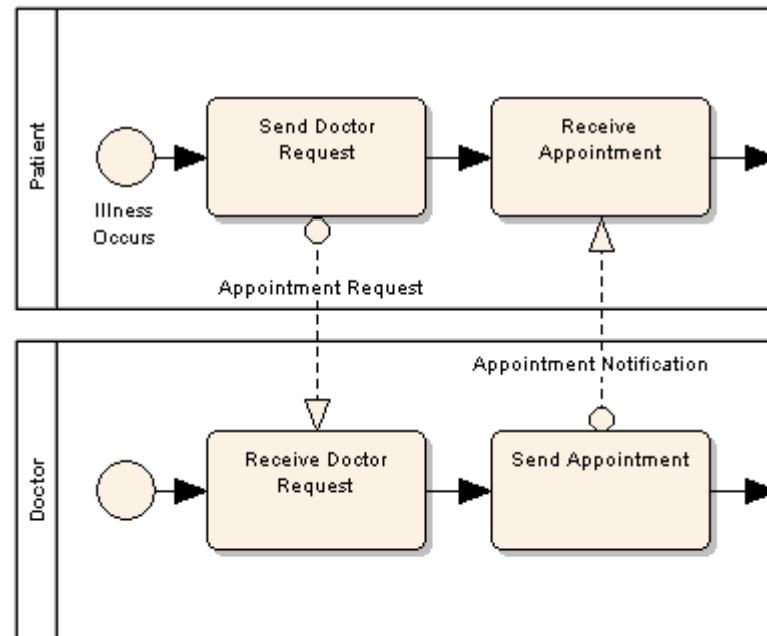
# Examples



# Examples (II)



# Examples (III)



# XPDL: XML Process Definition Language

- The FILE FORMAT for a process definition
- Exchange process definitions between
  - Different BPM/Workflow Products
  - Process Modelling/ Simulation tools and BPM/Workflow Products
  - Supported by more than 70 commercial BPA/ BPM products and interoperability demonstrated; use of tools that support the standard ensures that you are not locked in to any particular vendor
- Full support for BPMN

# BPEL: Business Process Execution Language

- Powerful programming language for Web service orchestration and XML manipulation
- Oriented toward building composite applications, not necessarily BPM
- Inflated expectations in media to be universal process language; now disillusioned
- No support for human activities
  - Look to BPEL4People effort to add this
- No sub-processes
  - Look to BPEL Subprocess effort to add this
- No on-the-fly process modifications

# Process Design Ecosystem

User needs

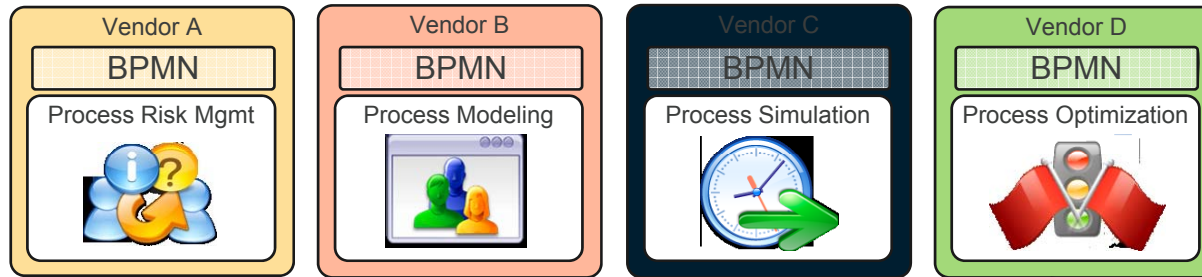
Risk/Control

Ownership/Issue

Resources/Time

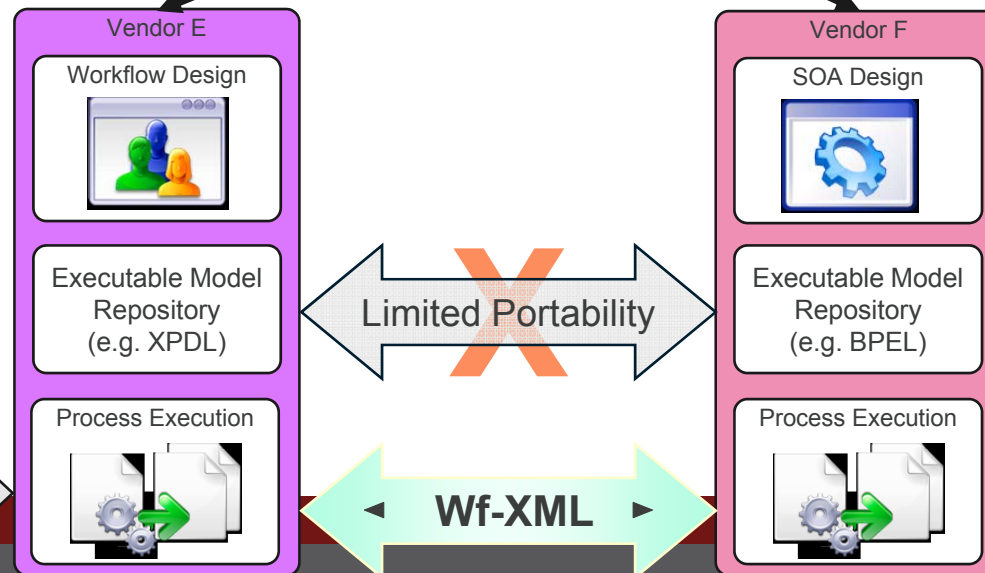
Goals/Strategies

Tool- specific capabilities



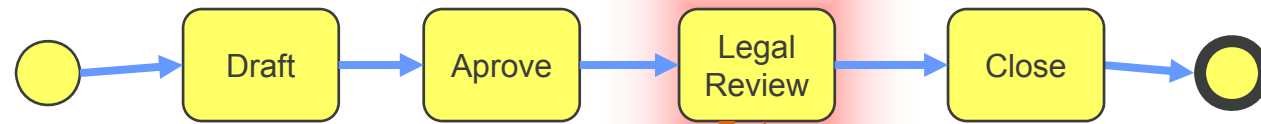
Process structure is shared by all tools

Execution environments have different strengths, no model exchange at this level



People Integration

- Sales Process on Server A



Standard Protocol between process engines allows one process to reuse another across technologies.

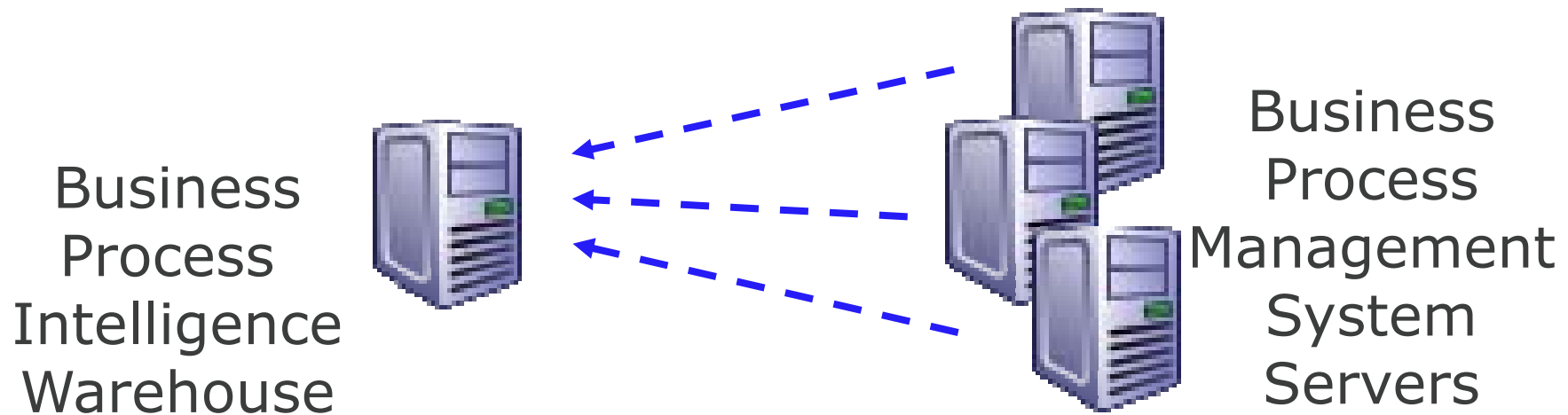
**Wf-XML**  
based on  
**SOAP or REST**



## Legal Review Process on Server B

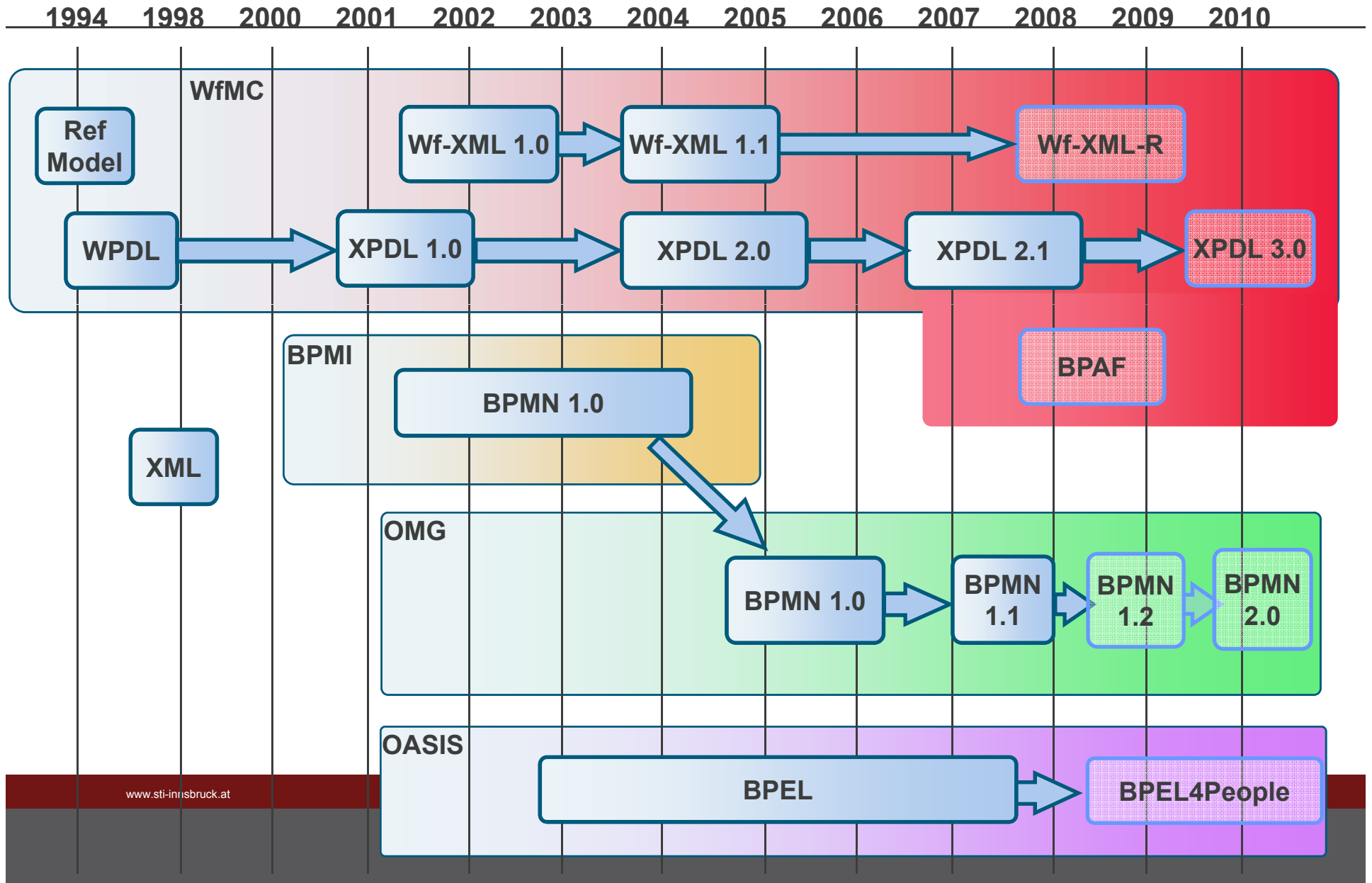
# BPAF: Business Process Analytics Format

- Standardized Event Format
  - XML Syntax
  - Defined Attribute Semantics
- Process State Model
- Activity State Model





# Standards Timeline - Releases





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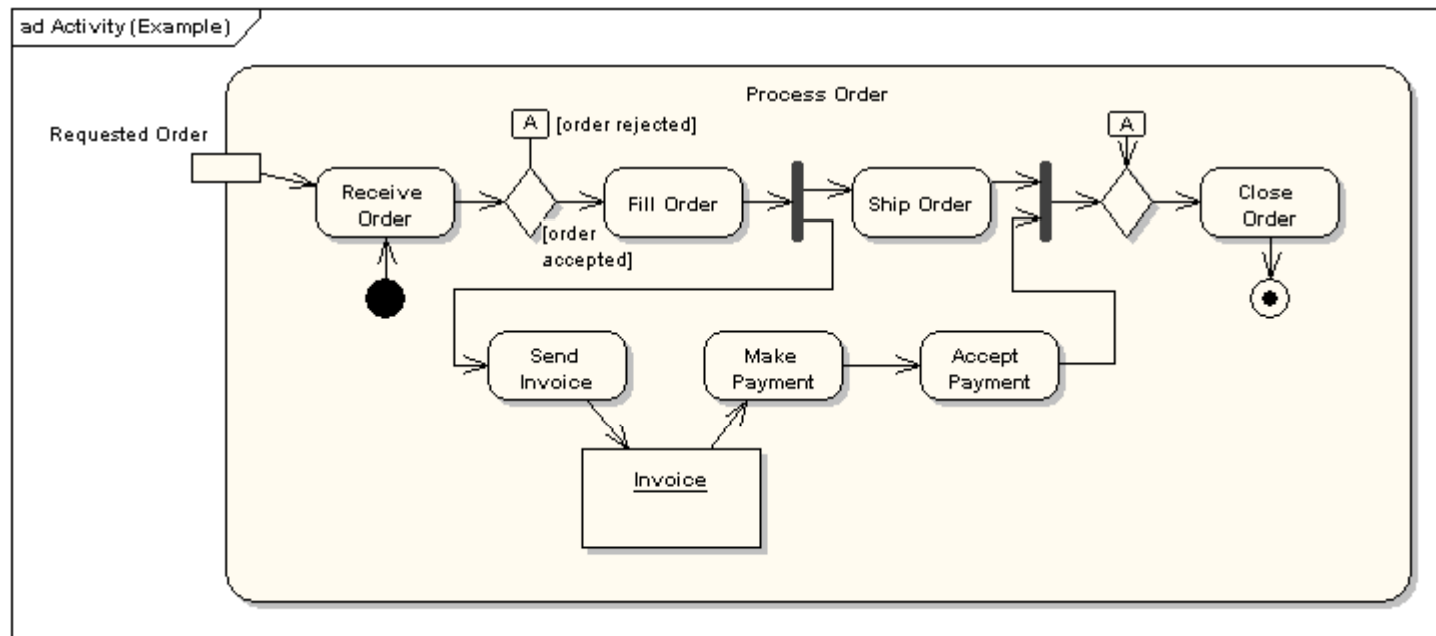
# UML and Business Process Modeling

[http://www.sparxsystems.com/resources/uml2\\_tutorial/index.html](http://www.sparxsystems.com/resources/uml2_tutorial/index.html)

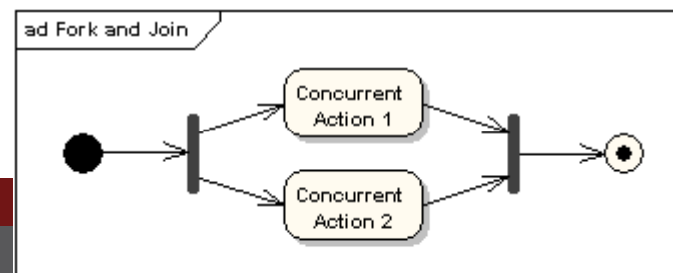
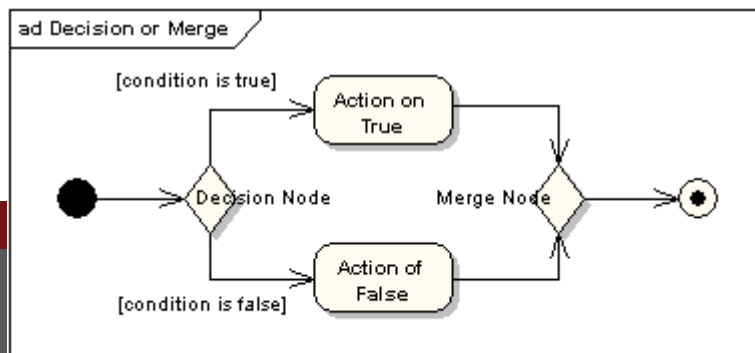
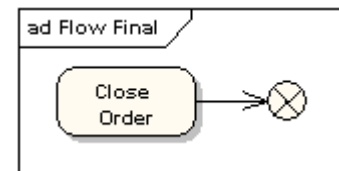
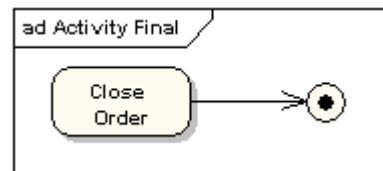
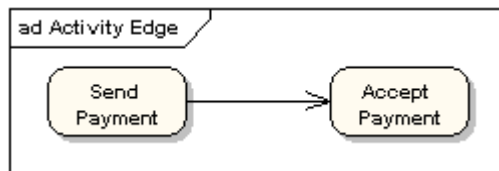
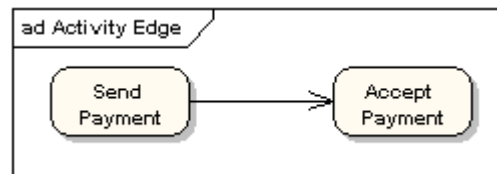
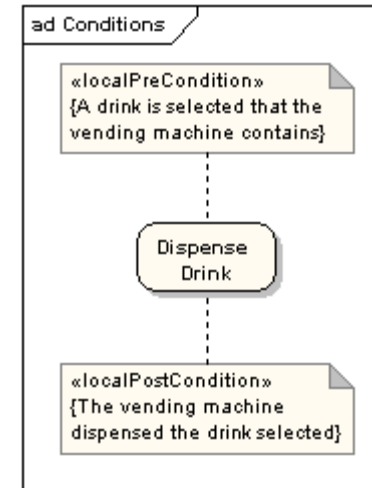
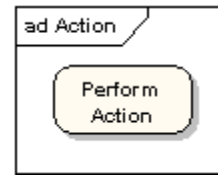
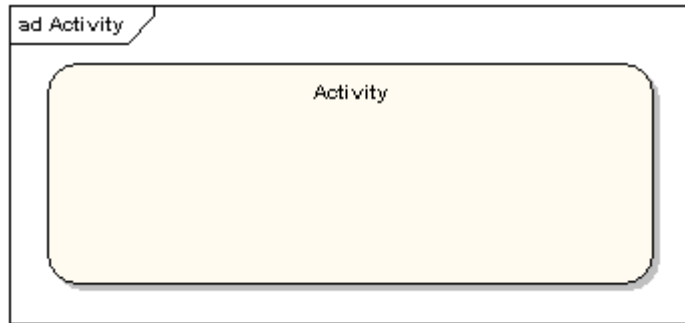
- UML emerged in the areas of software engineering and systems design.
- It can also be used at the analysis and modeling of business processes.
- UML 2.x provides behavioral diagrams which can capture information about processes and activities critical to every business.

- Behavior diagrams are about the interaction and the states of a model over time.
- They are intended to be used to capture information about how a system will act in a real-world environment, and about the effects and outcomes of particular operations executed within the system.
- **Activity diagrams** represent the business and operational workflows of components in a system.
- **State Machine diagrams** describe the states of a model during its execution.
- **Sequence diagrams** show the sequence of messages passed between objects using a vertical timeline.

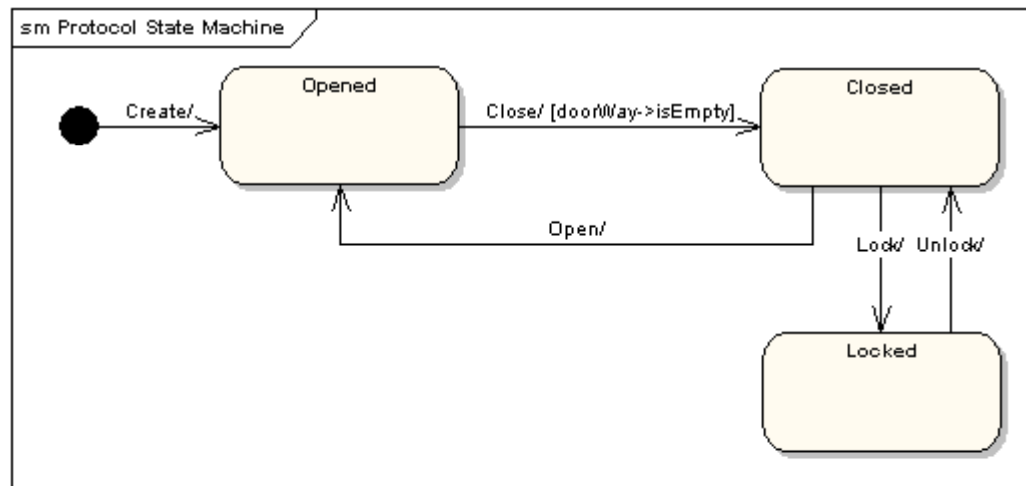
# Activity diagrams



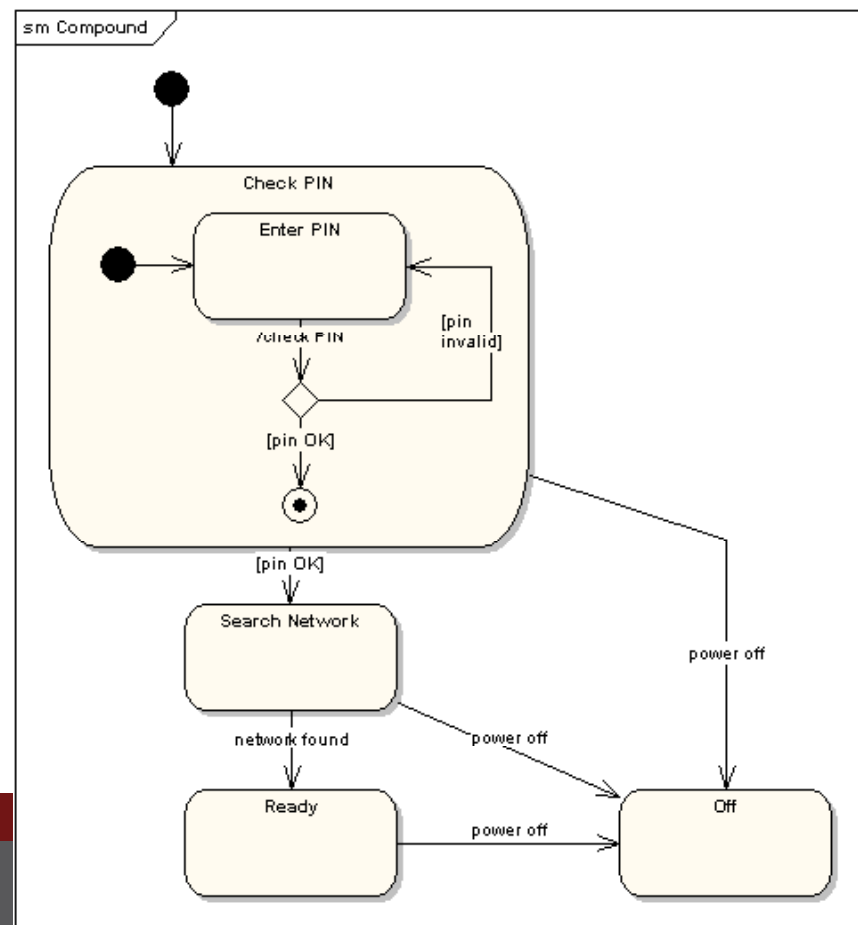
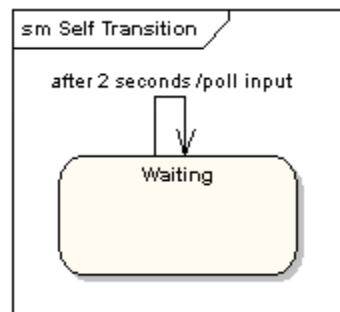
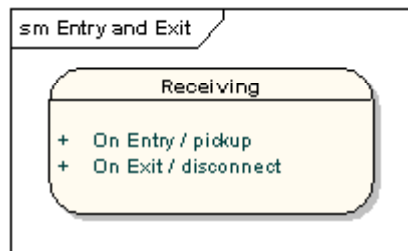
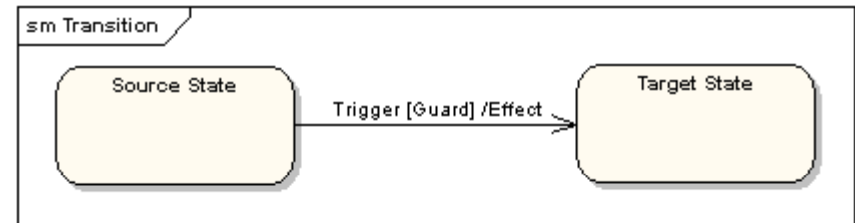
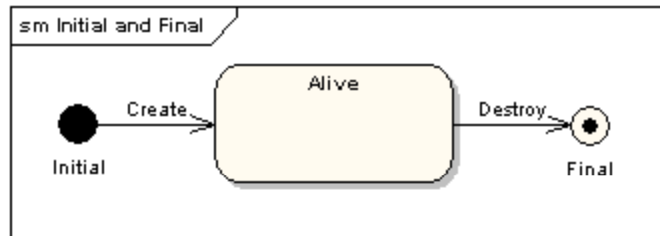
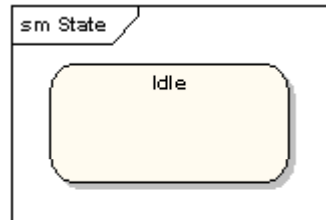
# Activity diagrams (II)



# State machine diagrams



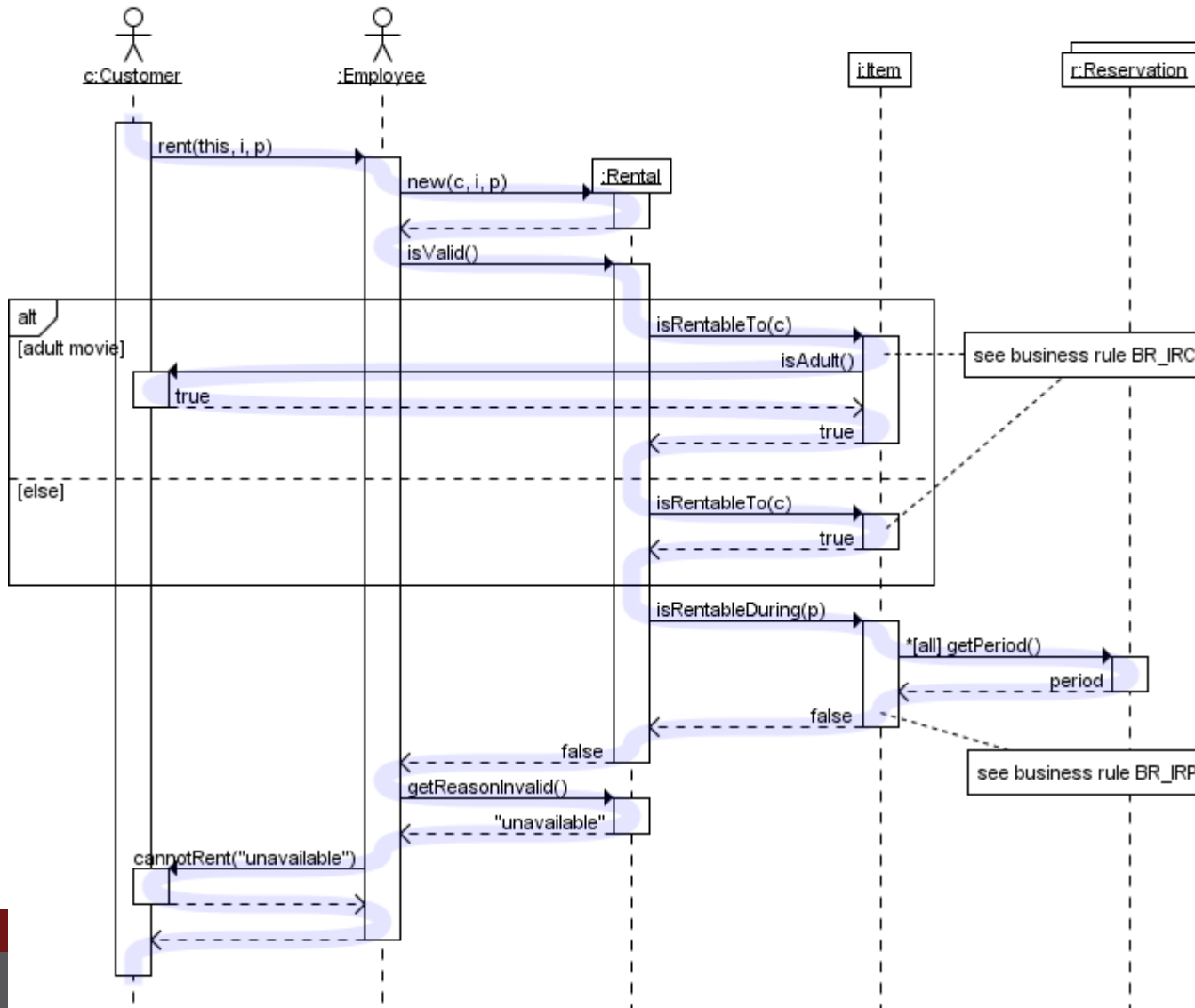
# State machine diagrams (II)





# Sequence diagrams

Collaboration "Rent Item", scenario "unavailable"



[http://www.tracemodeler.com/articles/a\\_quick\\_introduction\\_to\\_uml\\_sequence\\_diagrams/images/a%20typical%20sequence%20diagram.png](http://www.tracemodeler.com/articles/a_quick_introduction_to_uml_sequence_diagrams/images/a%20typical%20sequence%20diagram.png)

- 
- Process modeling and business process modeling
  - BPMN and other standard.
  - UML behavior diagrams.

## Further reading

- <http://www.bpmn.org/Documents/OMG%20BPMN%20Tutorial.pdf>