

## ***XPDL 2.0 and BPMN 1.0 Tutorial***

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*with help from*

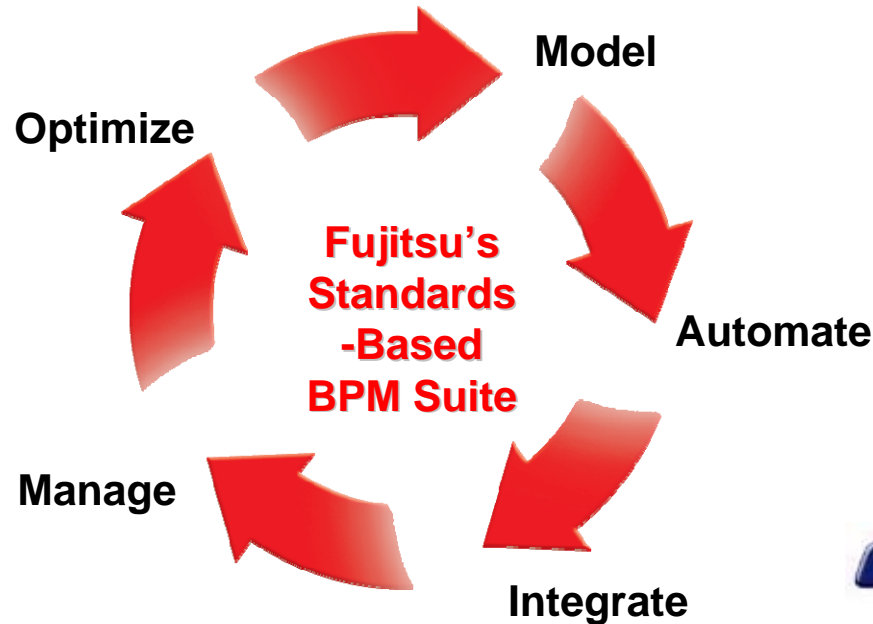
*Mike Marin – Vice Chair, Americas, WfMC Technical Committee  
FileNet Corporation*

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## *Webinar Sponsored by Fujitsu*

- Committed To Standards-Based BPM**
- Driving Standards' Direction**
- Evangelizing Standards**
- Championing Benefits From Interoperability & Reuse**



## *Agenda*

### **XPDL and BPMN - Background and Uses**

- Justin Brunt

### **XPDL 2.0 and BPMN Details**

- Keith Swenson

***Note: If you wish to ask questions, you may do so at any time by using the “Q&A” capability. We have people available to answer your questions while the presentation is proceeding. Be sure to address the question to all panelists.***

## *XPDL and BPMN - Background and Uses*



## *It's All About Processes*

**WfMC defines a process as:**

- ***“The representation of a business process in a form that supports automated manipulation, such as modeling, or enactment by a workflow [or business] management system. The process definition consists of a network of activities and their relationships, criteria to indicate the start and termination of the process, and information about the individual activities, such as participants, associated IT applications and data, etc.”***

## *Different Objectives, Slightly Different Terms*

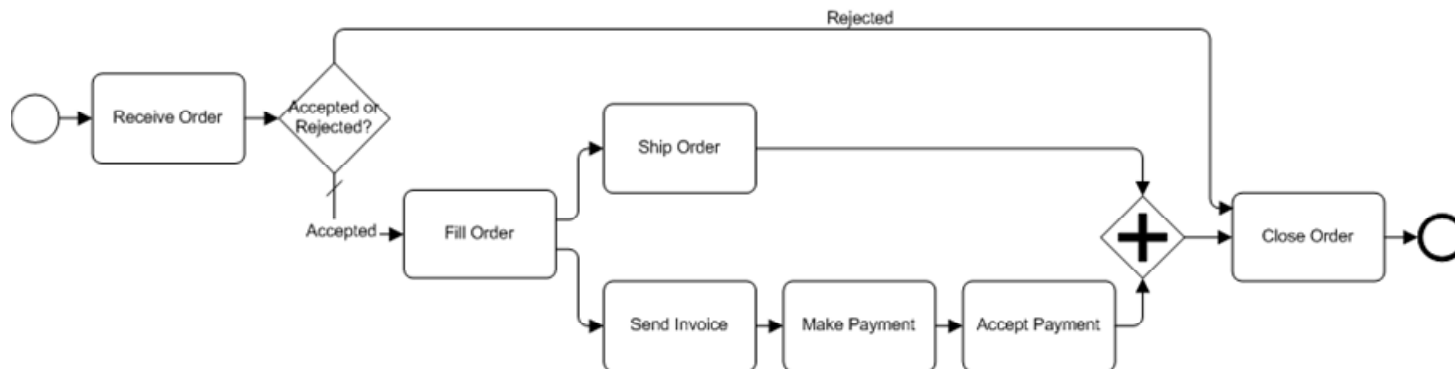
- BPMN – is a graphical notation for drawing a Business Process**
- XPDL – is an XML based Process Definition Language**

<b>BPMN Term</b>	<b>XPDL Term</b>
<b>Activity, Gateway, Event</b>	<b>Activity</b>
<b>Sequence Flow</b>	<b>Transition</b>
<b>Pool, Lane</b>	<b>Pool, Lane</b>

# The Process Definition

## □ Activity Network – Nodes & Transitions

- Sequential, Parallel, Conditional, and Message paths



## □ Activity Definitions

- Resource Requirement
- Work Assignment
- Applications and Services

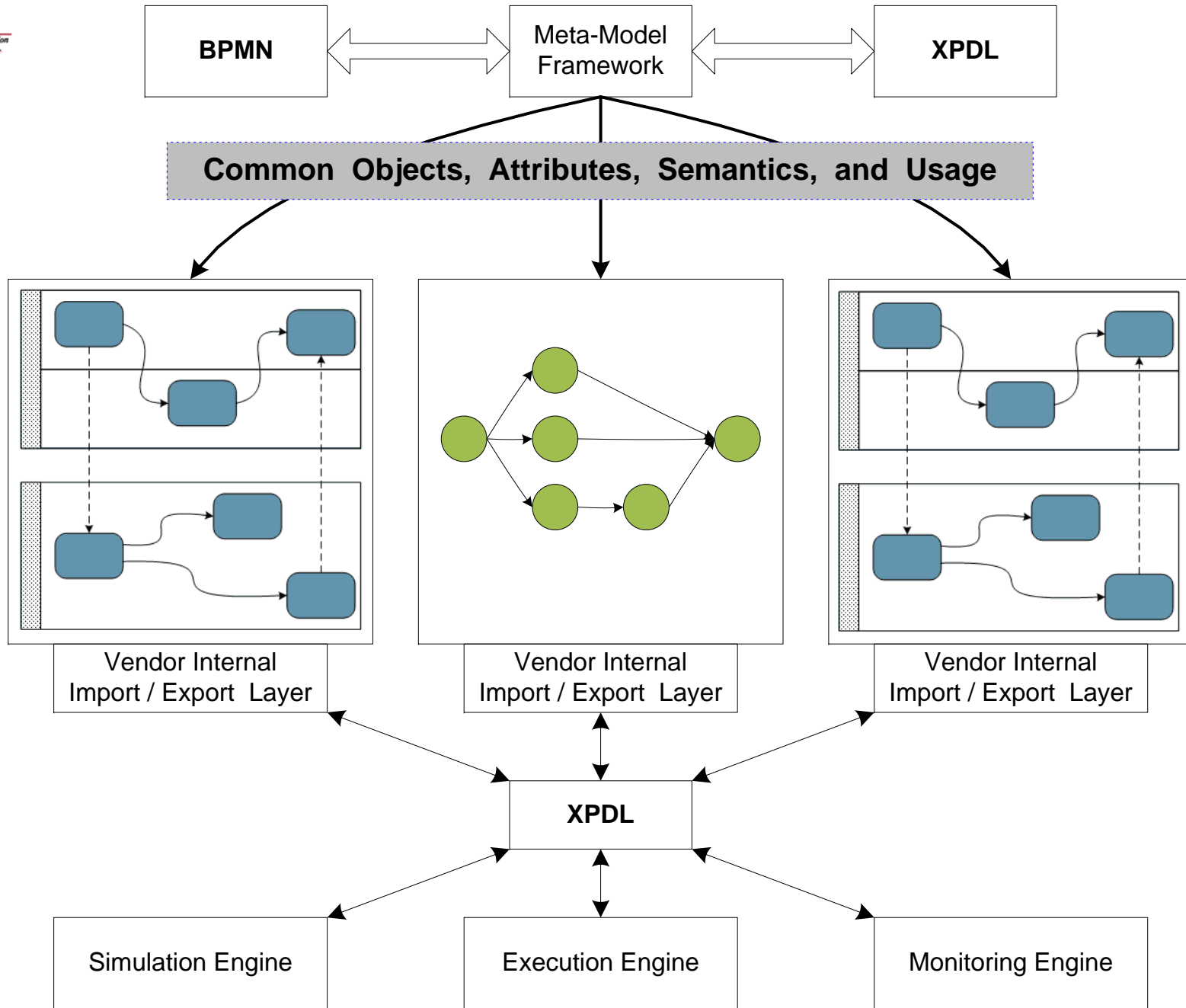
## □ Data Definitions

## ■ *Arbitrarily complex graphs*

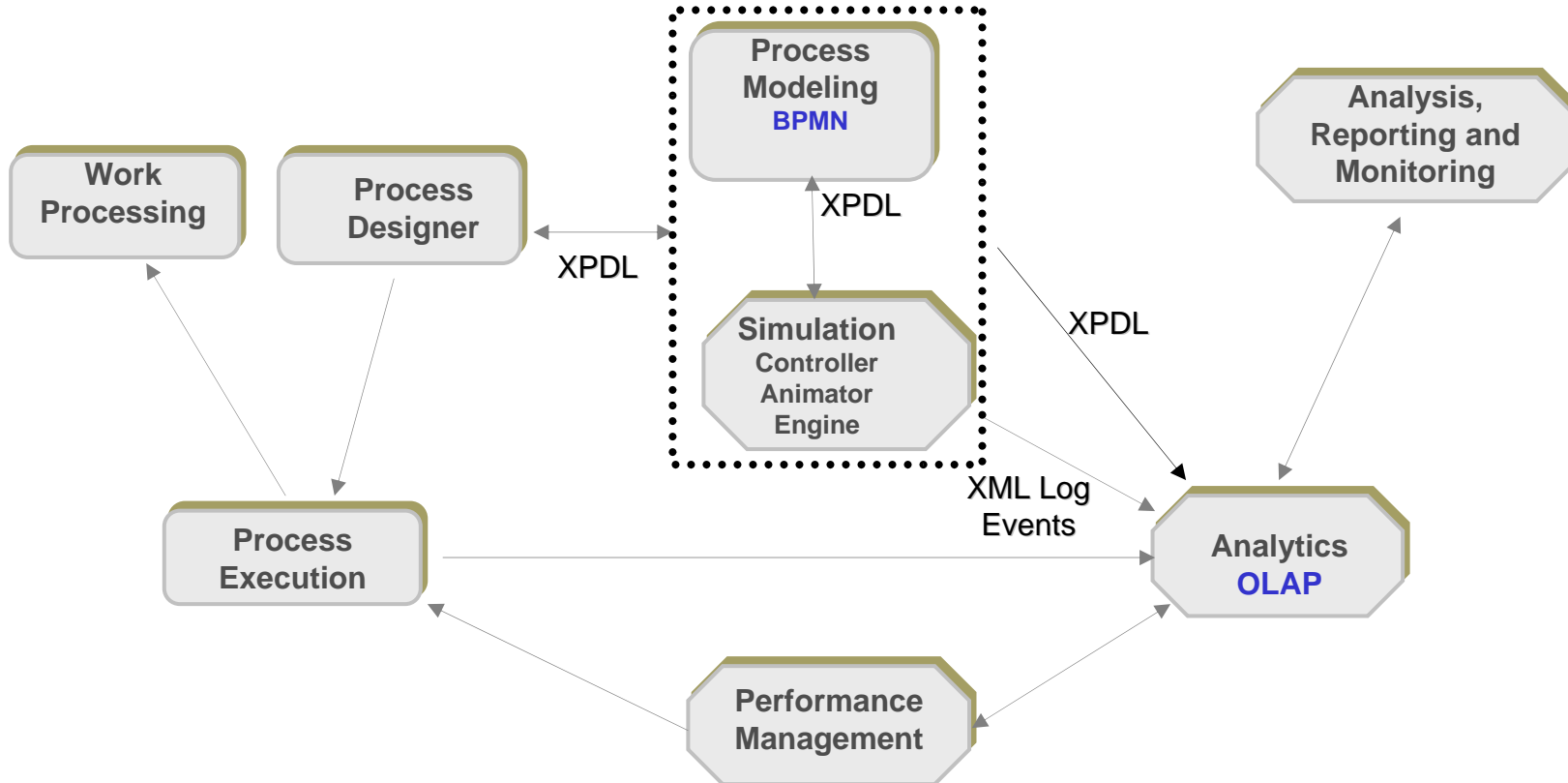
- Sequential Activities
- Parallel Activities
- Loops / Cycles
- Conditional Paths

## ***XPDL GOAL: Process Definition Interchange***

- Allow tools to exchange process models**
- Format to exchange Process Definitions between**
  - components in a Workflow/BPM Products
  - different BPM/Workflow Products
  - Process Modeling / Simulation tools and BPM/Workflow Products
- Implemented by commercial products**
- Interoperability demonstrated by WfMC member organizations at public events**



# An Example of Standards Utilization



## *The Origins of XPDL*

### **Formulated by WfMC**

- Members from organizations developing and using Workflow and BPM products

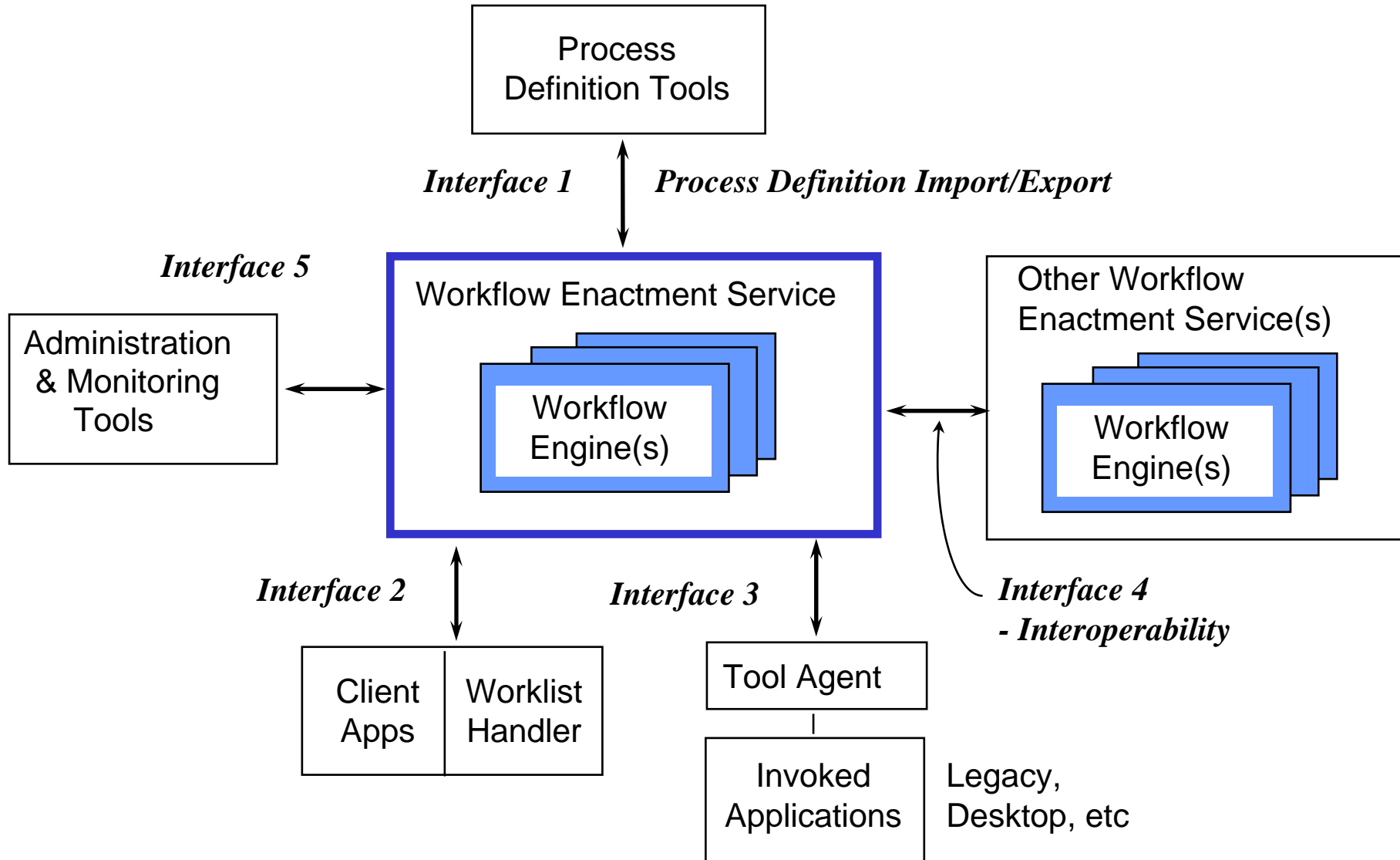
### **Concepts embodied in Meta-model and Glossary**

- [www.wfmc.org/standards/docs/TC-1011\\_term\\_glossary\\_v3.pdf](http://www.wfmc.org/standards/docs/TC-1011_term_glossary_v3.pdf)

### **Reference Model defines the interfaces**

- [www.wfmc.org/standards/docs/tc003v11.pdf](http://www.wfmc.org/standards/docs/tc003v11.pdf)

# The Workflow Reference Model



## *WfMC Reference Model*

- ❑ **Interface 1 – Process Definition Tools**
  - Definition of a standard interface between process definition and modeling tools and the work flow engine(s).
- ❑ **Interface 2 – Workflow Enactment**
  - Definition of APIs for client applications to request services from the workflow engine to control the progression of processes, activities and work-items.
- ❑ **Interface 3 – Invoked Applications**
  - A standard interface definition of APIs to allow the workflow engine to invoke a variety of applications, through common agent software.
- ❑ **Interface 4 – Other Workflow Enactment Services**
  - Definition of workflow interoperability models and the corresponding standards to support interworking.
- ❑ **Interface 5 – Administration and Monitoring Tools**
  - The definition of monitoring and control functions.

## *History Behind XPDL*

- ❑ **XPDL is an implementation of Interface 1**
  - Interchange of process definitions between different tools and vendors viewed as essential
- ❑ **WPDL (Workflow Process Definition Language)**
  - First implementation of Interface 1
  - Text based (predated XML) definition
  - Published November 1998
- ❑ **XDPL 1.0**
  - Popularity of XML and use for defining document formats for the Internet
  - Experience in using WPDL
  - Retained semantics of WPDL
  - New Syntax using XML Schema
  - Published October 2002
  
- ❑ **Neither WPDL or XPDL proposed graphical representation**

## *XPDL Flexibility Requirement*

### **Large variety of tools**

- Many differing requirements on what must be stored
- Not acceptable if XPDL could store only a subset
- Must be able to store all the information

### **XPDL is extensible**

- Handle information used by a variety of different tools

### **Different dialects of XPDL**

- Use extended attributes to define vendor specific features

### **Can transform from one dialect to another**

## *Origins of BPMN*

### **Developed by members of BPML.org**

- Business Process Management Initiative
- BPML.org merged with OMG June 2005
- [www.bpmn.org](http://www.bpmn.org), [www.omg.org](http://www.omg.org)

### **BPMN 1.0 Published May 2004**

### **Drawn on expertise from different modelling disciplines**

- UML Activity Diagram, UNL EDOC Business Processes, IDEF, ebXML BPSS, Activity-Decision Flow (ADF) Diagram, RosettaNet, LOVeM, Event Process Chains (EPCs)

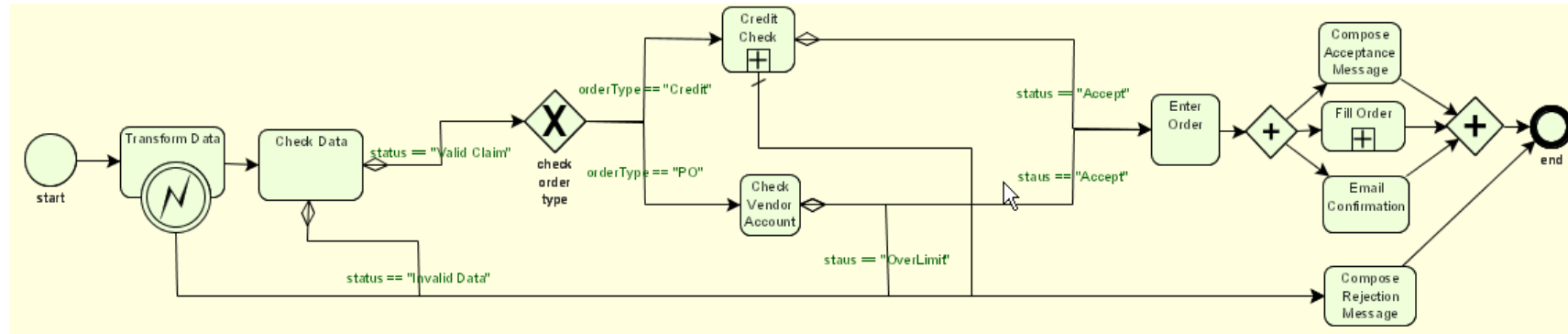
## *Definition of BPMN*

### **□ Business Process Modeling Notation (BPMN)**

The BPMN will provide businesses with the capability of defining and understanding their internal and external business procedures through a Business Process Diagram, which will give organizations the ability to communicate these procedures in a standard manner.

- The BPMN Working Group Seeks to minimize the technical constraints placed upon the business user when modeling business processes. This principle is paramount.**

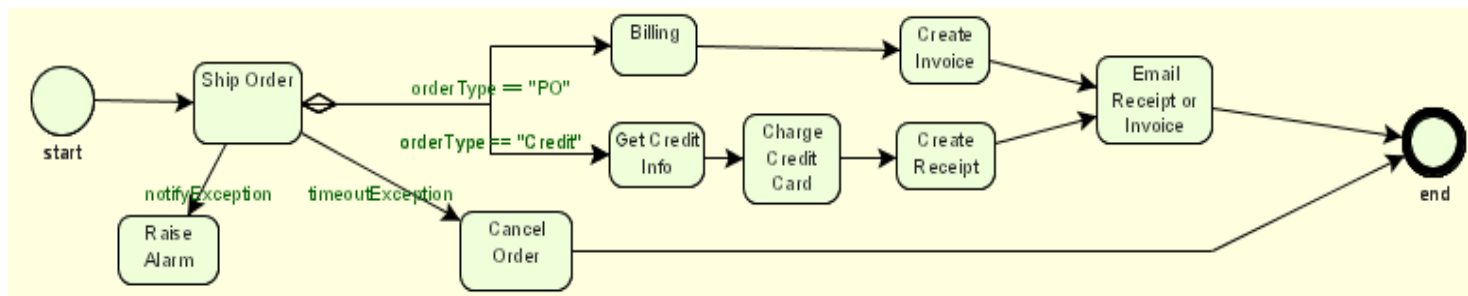
## An Example of BPMN from XPDL Spec



Credit Check



Fill Order



## *Scope of BPMN*

- Unify and extend graphics to express semantics required by**
  - Workflow Processes
  - EAI Processes
- Only supports modelling concepts that are applicable to Business Processes**
- Aimed at both Technical and Business Users**
  - Facilitate communication between users of complex business processes
  - Readily understandable by all business users
  - Business Analysts create initial drafts of processes
  - Technical developers implementing processes
  - Business people manage and monitor processes
- Encompasses techniques employed in flowcharts**
- Includes support for all WS-BPEL constructs (WS Business Process Execution Language)**

### **Does not include**

- Organizational structures and resources
- Functional breakdowns
- Data and information models
- Business Rules
- A mechanism for storage

**Relationships between BPMN and other high-level business modelling will be defined at some later date**

**BPMN shows flow of data and association of data to Artifacts -- But it's not a data flow diagram**

## *Uses of BPMN*

- ❑ **Targeted at different types of Business Process**
- ❑ **Allows creation of end-to-end business processes composed of multiple processes.**
- ❑ **Three basic types of sub-model within an end-to-end BPMN model**
  - Private (internal) business processes
    - Internal to a specific organization
  - Abstract (public) processes
    - Represents interaction between a private business process and another process or participant
    - Only activities used to communicate outside the private business process are included
  - Collaboration (global) processes
    - Represents interactions between 2 or more business entities
    - Sequence of activities representing message exchange between entities

## *Origins of XPDL 2.0*

- Enhancements based on feedback on XPDL 1.0**
- Includes support for BPMN constructs**
- Can store process definitions drawn in BPMN**
  - BPMN does not provide this
- XPDL 2.0 is compatible with XPDL 1.0**
- Published October 2005**
  - Already a number of implementations available
  
- XPDL and BPMN address the same modeling space**

## *XPDL Support in Market*

- ❑ **ADVANTYS WorkflowGen supports XPDL**
- ❑ **Enhydra: Open Source Java Projects**
  - Shark: XPDL Workflow Engine
  - JaWE: Graphical XPDL Workflow Editor
- ❑ **Fuego offers XPDL in their process design tool, this is their main exchange format**
- ❑ **Fujitsu Interstage BPM (i-Flow)**
- ❑ **Global 360 supports XPDL including a free plugin to Visio that edits XPDL.**
- ❑ **Integic e.POWER WorkManager Builder imports and exports XPDL format**
- ❑ **Interwoven's WorkSite MP**
- ❑ **IDS Scheer's Business Architect produces XPDL**
- ❑ **Lynx Flow Designer, Eclair Group, supports XPDL**
- ❑ **Metoda S.p.A, OpenMet BPMF is compliant with XPDL**
- ❑ **Proforma ProVision exports XPDL**
- ❑ **SSA Global, BAAN, iSeries, BPCS**



## *XPDL Support in Market*

- FileNet exports XPDL
- Tell-Eureka's customer self-service solutions.
- Open Business Engine, Java based **Open Source** workflow, supports XPDL
- OpenPages Compliance Solutions
- Oracle9i Warehouse Builder 9.2 saves process definitions in XPDL
- Simprocess - XPDL support is now included for Simulation Models
- TIBCO Staffware Process Suite supports XDPL and BPMN
- Vignette Process Workflow Modeler
- WfMOpen is an **Open Source** workflow engine that uses XPDL as its Interface 1 format
- ZAPLET 3, PROCESS BUILDER is a designer that supports XPDL
- Zynium's Byzio product converts any Visio diagram into XPDL by user controlled map.
- ... and many more



## *XPDL and BPMN* *Details*



### **Constructs**

- Package
- Process
- Pools/Lanes
- Artifacts
- Nodes: Activity, Gateway, Event
- Connections/Transitions

### **For each of the basic constructs:**

- How BPMN presents them
- How XPD L saves them in a file

## *Core Set of BPMN Elements*

### Nodes

#### Events



#### Activities



#### Gateways



### Connections

#### Sequence Flow



#### Message Flow

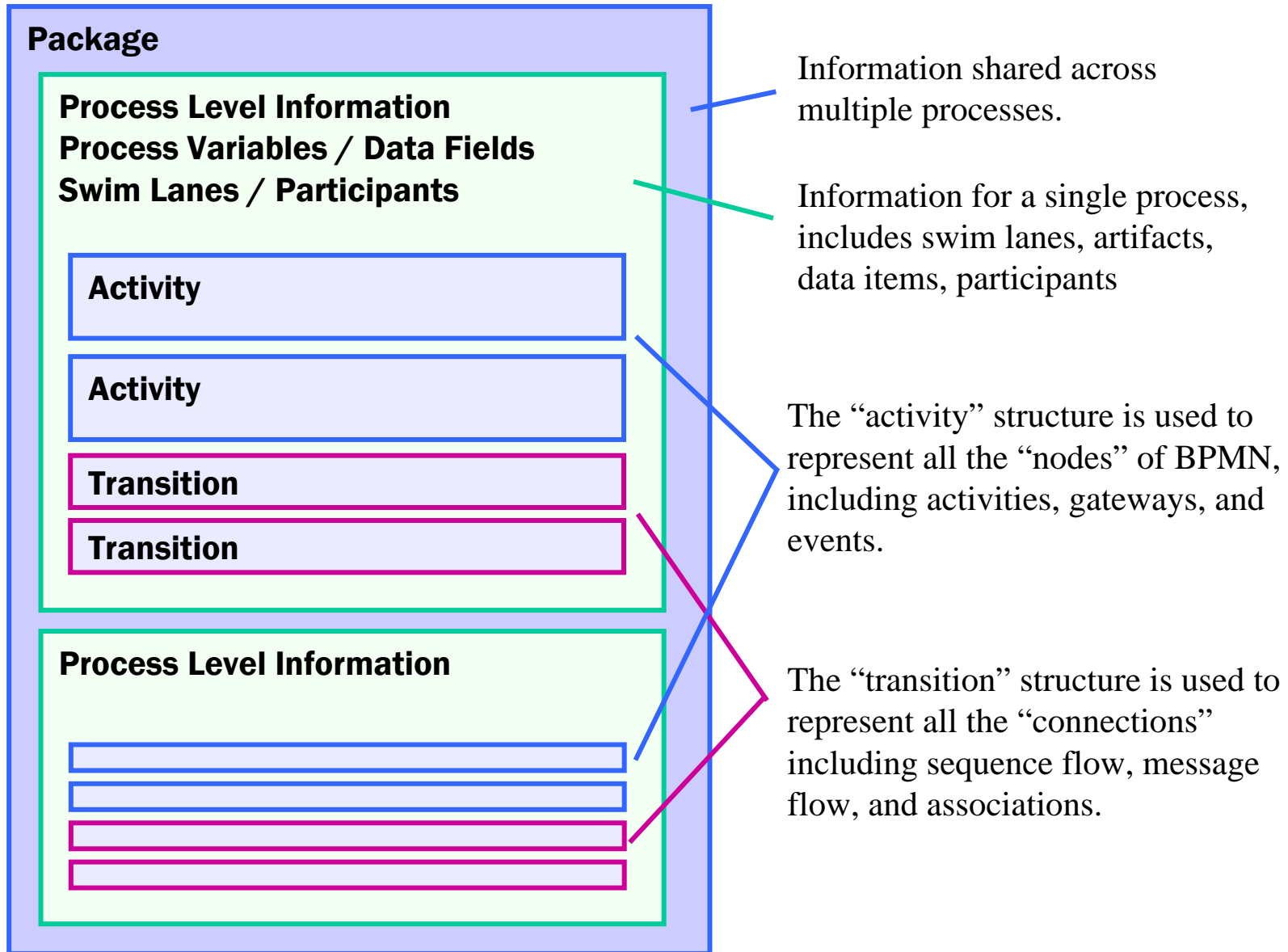


#### Association



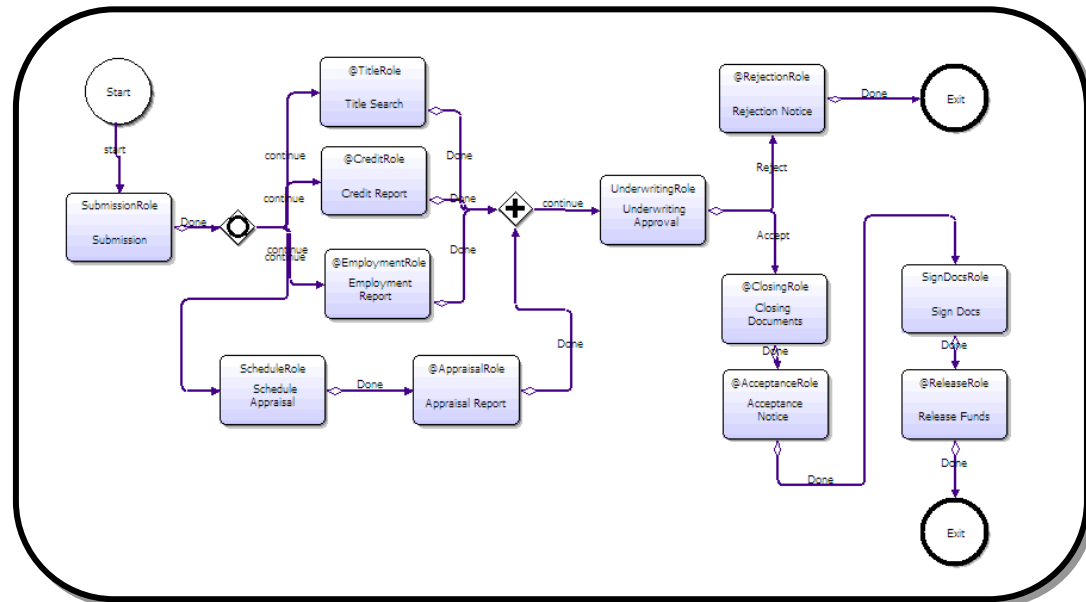
***The core set of modeling elements enable the easy development simple Business Process Diagrams that will look familiar to most Business Analysts (a flowchart diagram)***

## *XPDL Basic Structure*

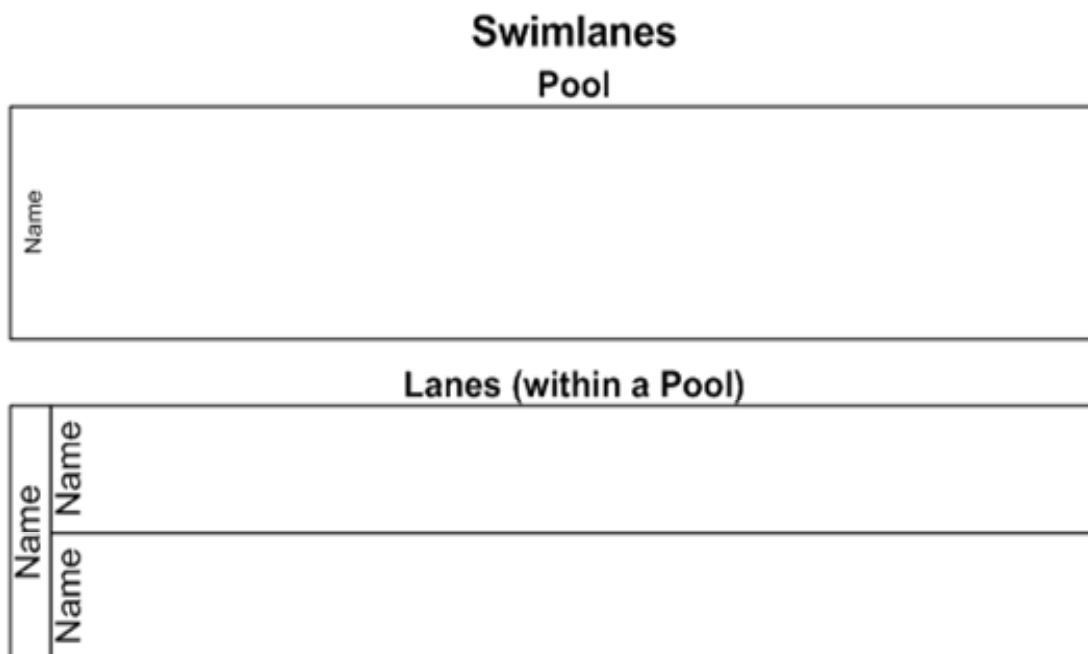


## Package & Process

- ❑ The package is the root node of an XPDL file
- ❑ Package contains one or more separate processes
- ❑ A package can contain multiple BPMN diagrams
  - Each diagram is denoted as a “page”



## Swimlanes

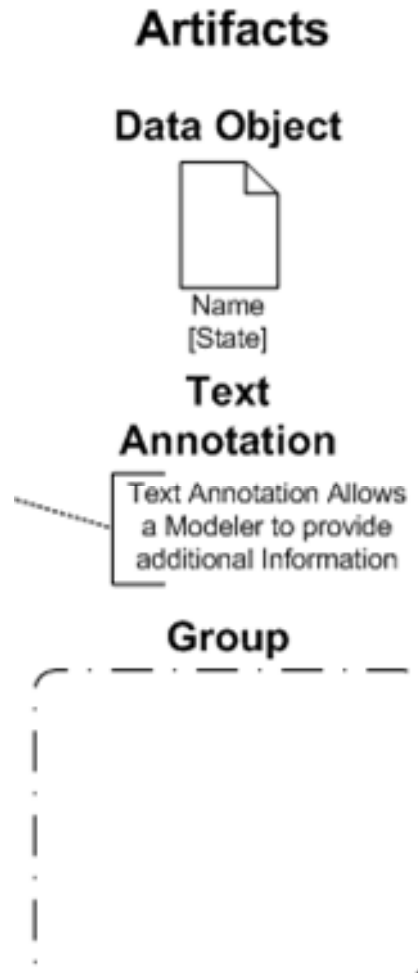


***A Pool is a graphical container for partitioning a set of activities from other activities, usually in the context of B2B situations.***

***A Lane is a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally. Normally represents a role or an organizational unit responsible for the actions, but can be any organizing theme.***

***New XPD L 2.0 construct to support storage of pool and lane information.***

## *BPMN Artifacts*



***Data Objects are not flow objects (i.e., connected through Sequence Flow), but they do provide information about how documents, data, and other objects are used and updated within a Process.***

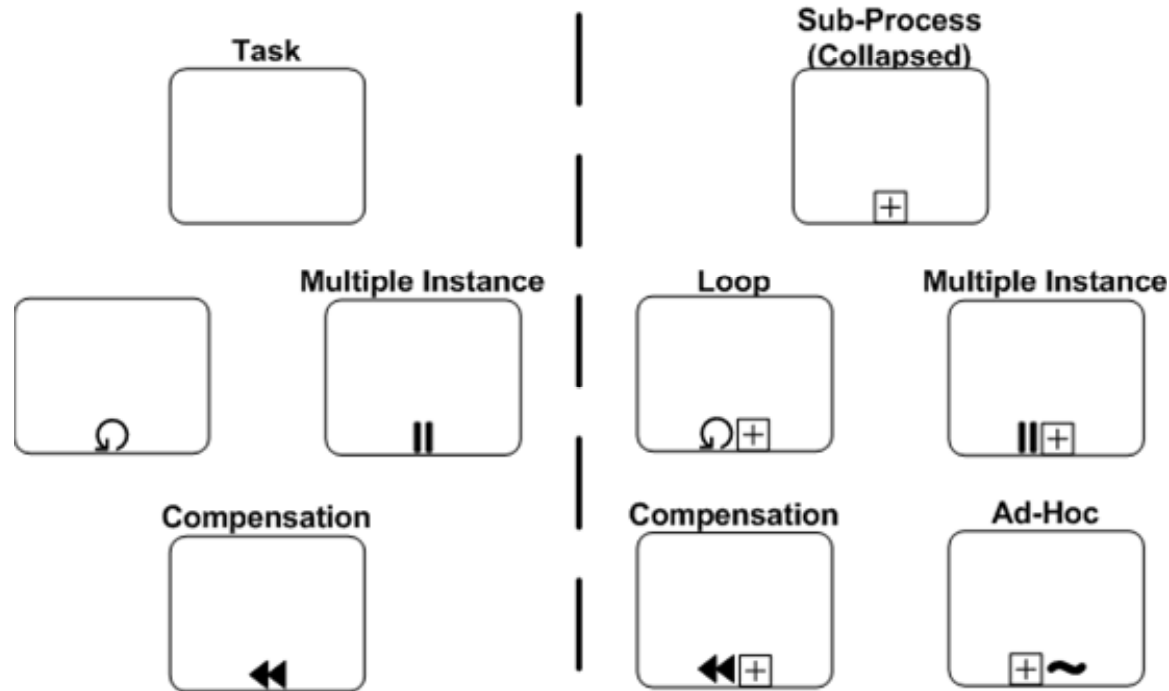
***Text Annotations are a mechanism for a modeler to provide additional information for the reader of a BPMN diagram.***

***Groups provide a mechanism to visually organize activities***

***New XPD 2.0 structures to store this information.***

***XPD 2.0 additionally has Data Items to hold process relevant and application data.***

## *BPMN Activity == XPDL Generic Activity*





***An activity is work that is performed within a business process.***

***An activity can be atomic or non-atomic (compound).***

***The types of activities that are a part of a Process Model are:  
 Process, Sub-Process, and Task.***

## *BPMN Event == XPDL Event Activity*

	Events		
	Start	Intermediate	End
			
	Event Types		
Message			
Timer			
Exception			
Cancel			
Compensation			
Rule			
Link			
Terminate			
Multiple			

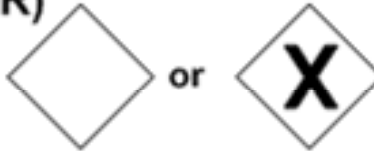
**An Event is something that “happens” during the course of a business process. These Events affect the flow of the Process and usually have a trigger or a result. They can start, interrupt, or end the flow.**

# *BPMN Gateways == XPDL Route Activity*

## Gateways

Exclusive Decision/Merge (XOR)

Data-Based



Event-Based



Inclusive Decision/Merge (OR)



Complex Decision/Merge



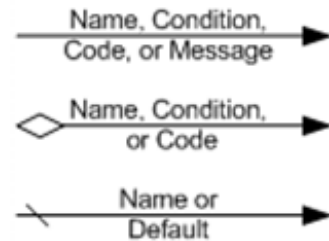
Parallel Fork/Join (AND)



**Gateways are modeling elements that are used to control how Sequence Flows interact as they converge and diverge within a Process. If the flow does not need to be controlled, then a Gateway is not needed.**

## *BPMN Connection == XPD L Transition*

### Sequence Flow



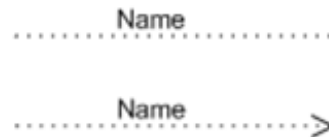
***A Sequence Flow is used to show the order that activities will be performed in a Process.***

### Message Flow



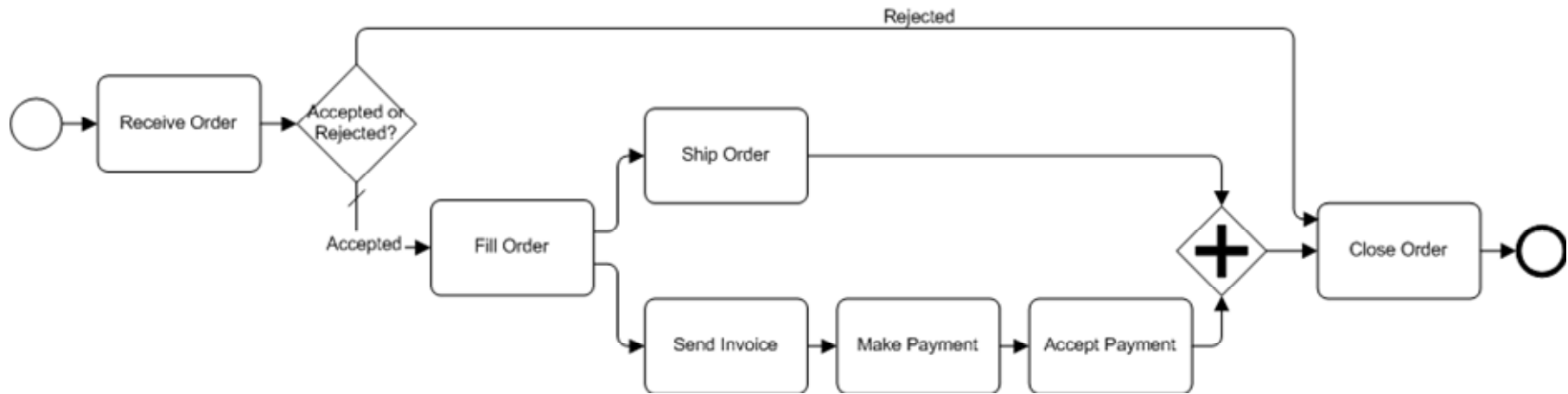
***A Message Flow is used to show the flow of messages between two entities that are prepared to send and receive them.***

### Association

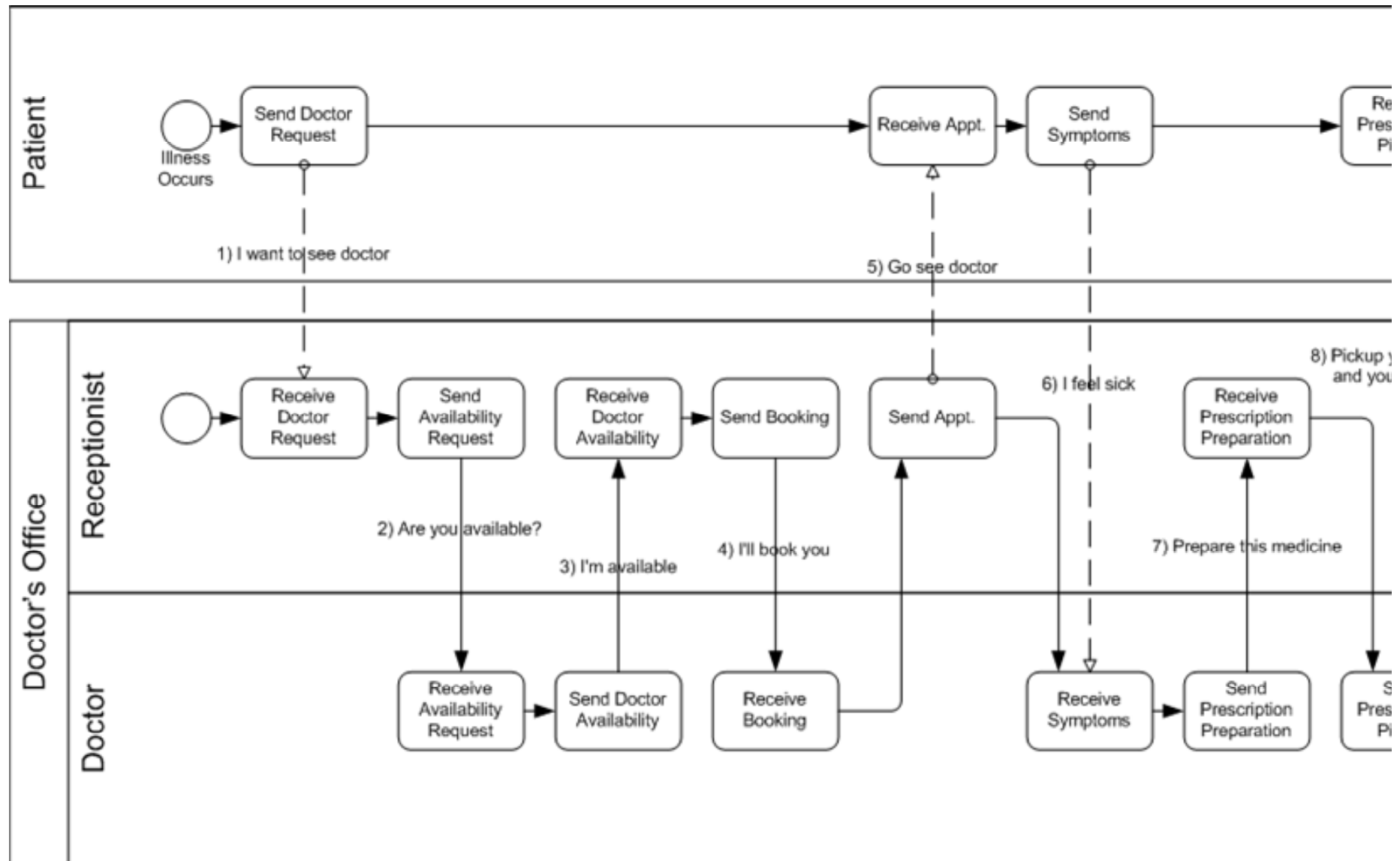


***An Association is used to associate information and artifacts with flow objects.***

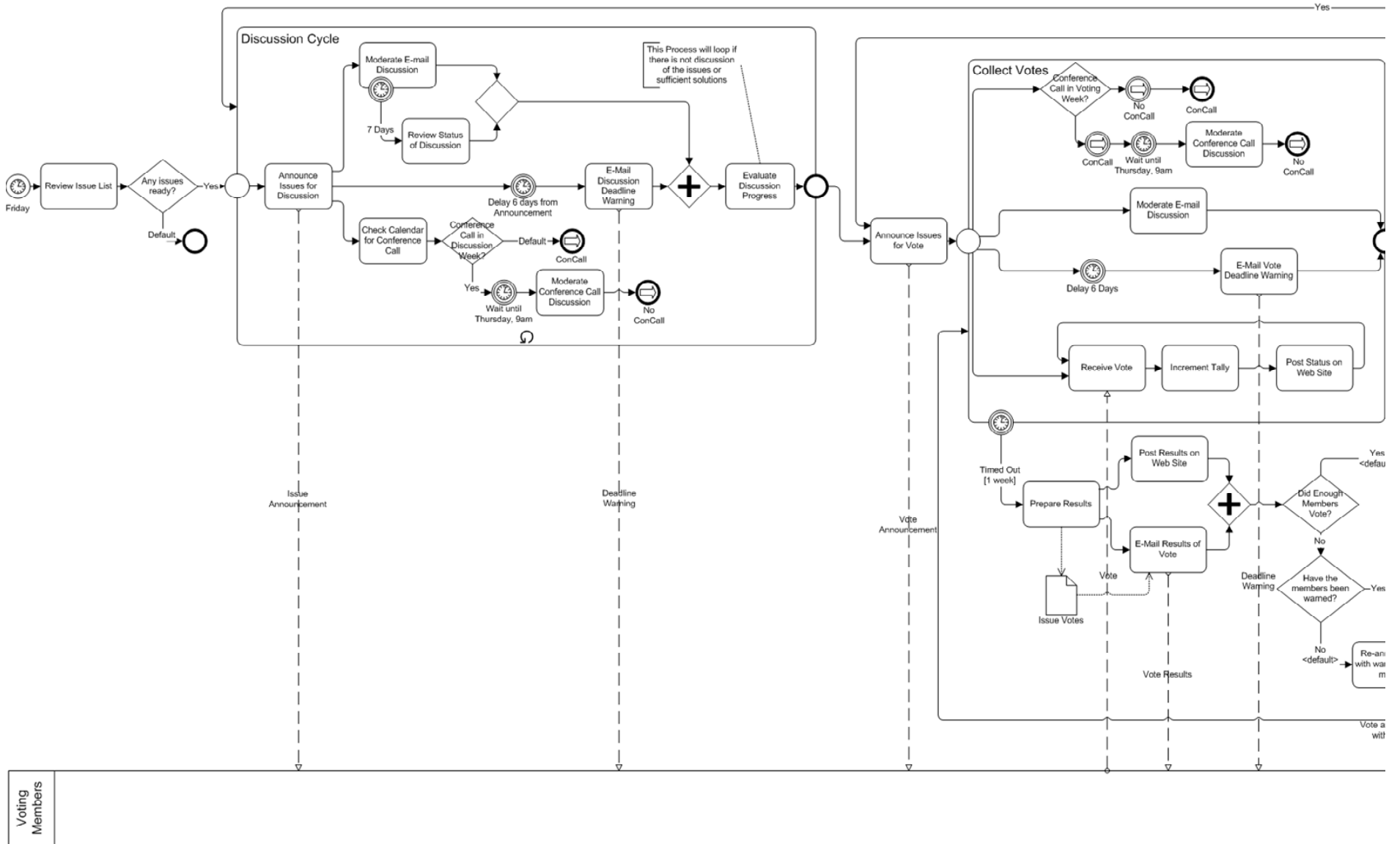
# Normal Flow



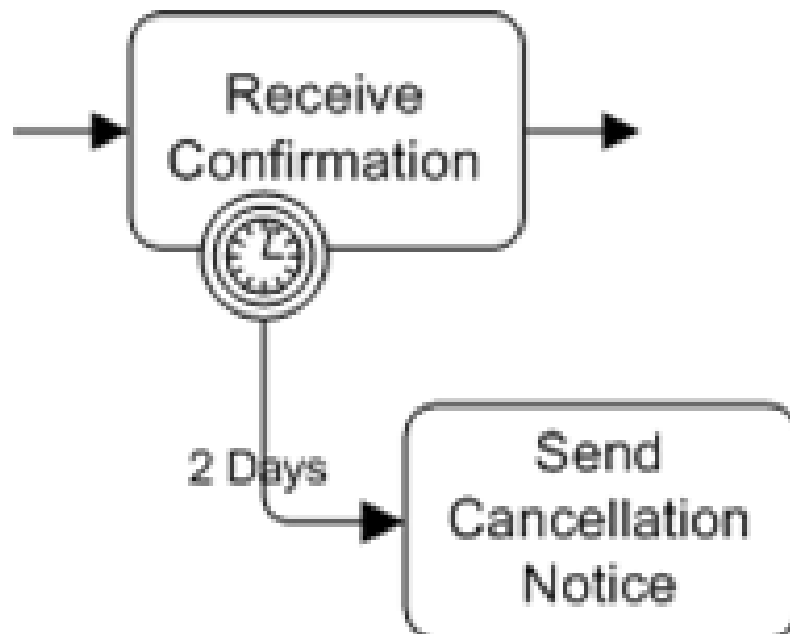
# B2B Modeling



# A Complex Process

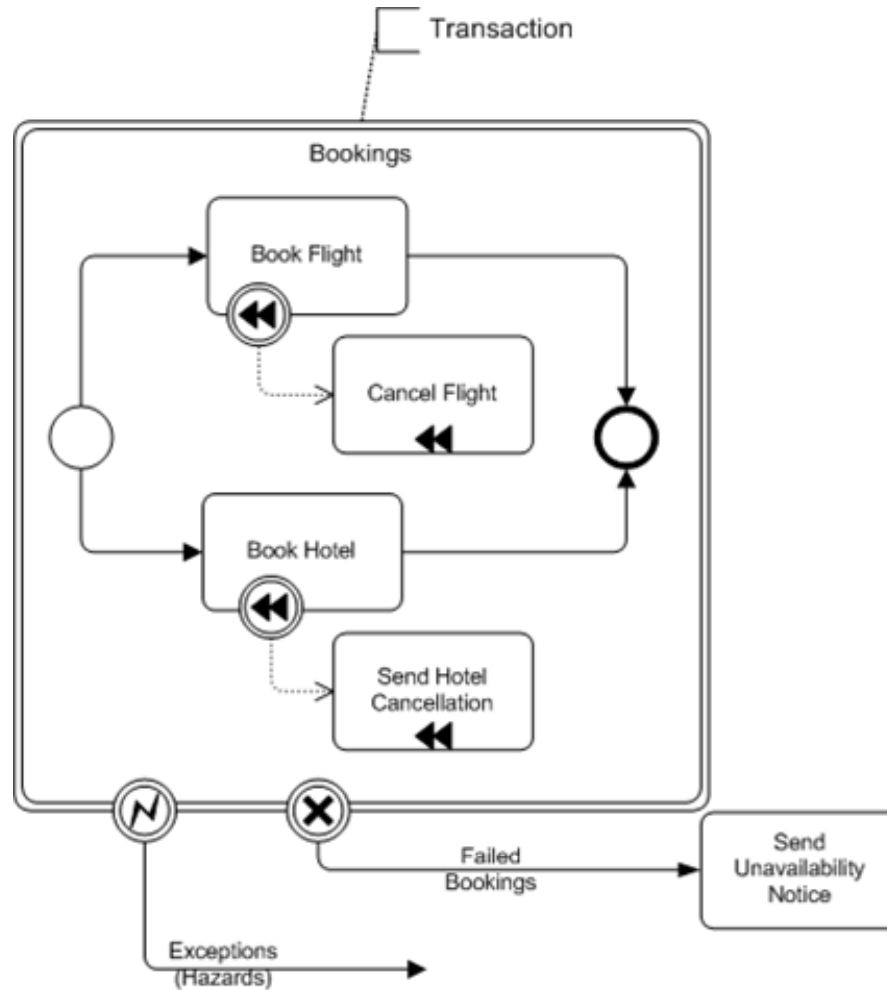


## *Exception Handling*



**Intermediate Events attached to the boundary of an activity represent triggers that can interrupt the activity. All work within the activity will be stopped and flow will proceed from the Event. Timer, Exceptions, Messages, etc. can be Triggers.**

# Compensation Handling and Transactions



**A Transaction is an activity that has a double border. Transactions are supported by a transaction protocol (e.g., WS-Transaction).**

**Normal Outgoing Sequence Flow represents the path to follow a successful completion.**

**A Cancel Intermediate Event represents the path to follow a cancelled completion.**

**An Exception Intermediate Event represents the path to follow a transaction hazard.**

**Activities used for compensate (with marker) are outside normal flow and are Associated normal activities.**

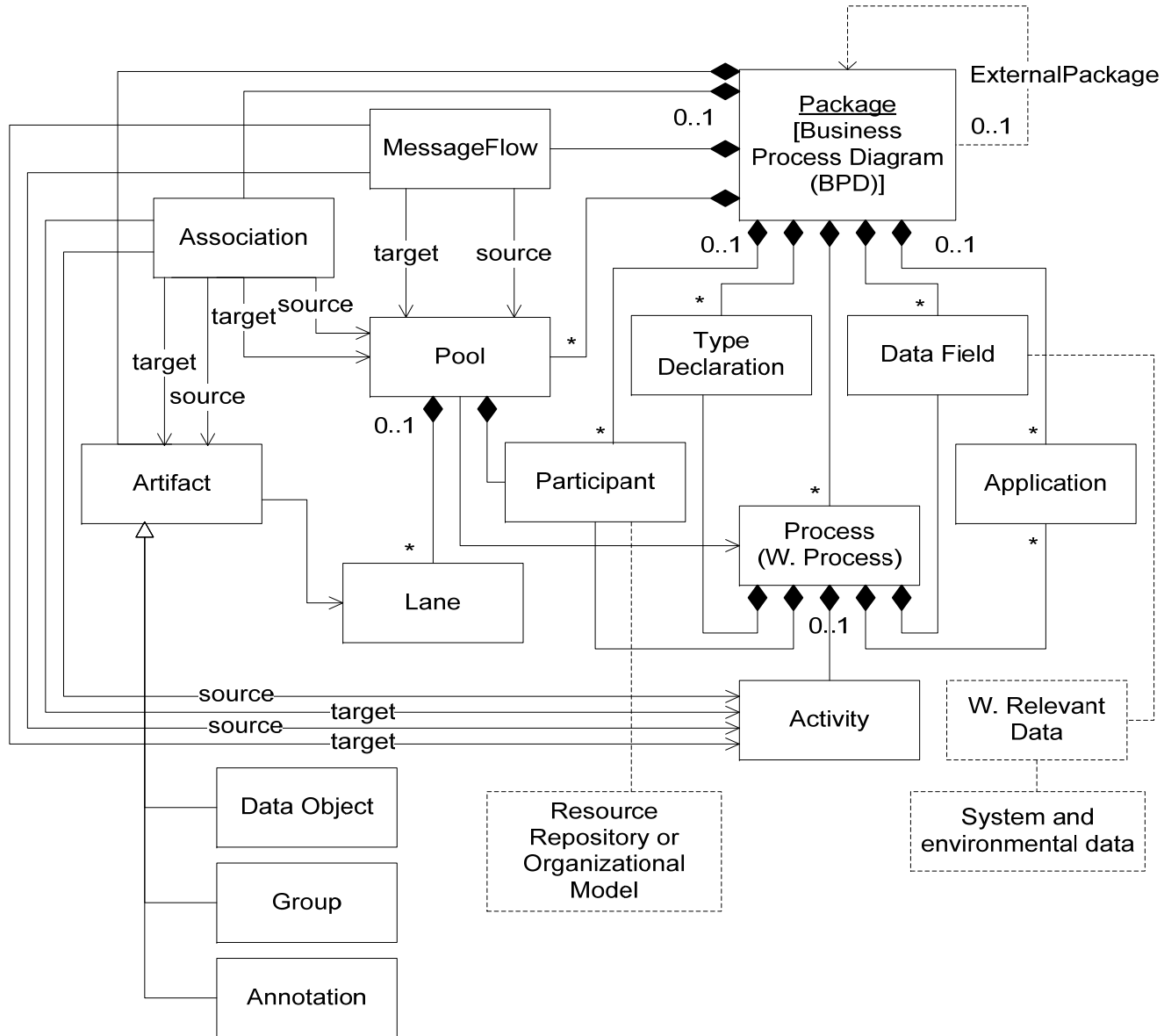
## *XPDL Extended Attributes & Elements*

- ❑ **XPDL schema is extensible**
  - ExtendedAttributes
  - Any Elements
- ❑ **Allows vendors to extend XPDL**
  - Adds arbitrary XML in a well defined manner
  - Defines how to handle “unrecognized” elements
- ❑ **Each tool can add tool specifics**
  - Tool specific graphical information
  - Multiple representations of process parts
  
- ❑ **This is a necessity for successful interchange**

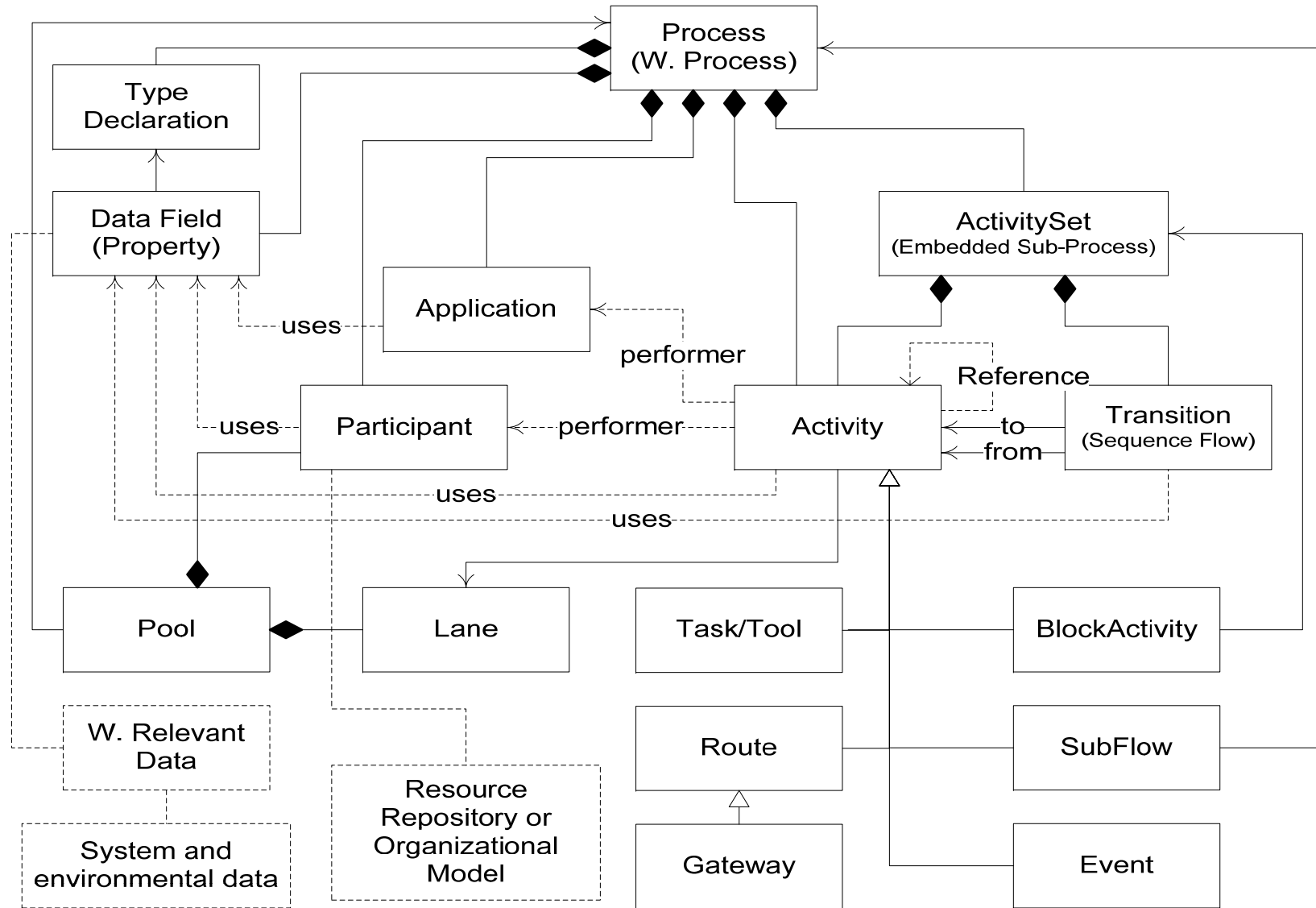
## *Invisible Process Semantics*

- In/Out formal parameter, standard data formats**
- Parameter transformation to/from subprocess**
- Date / Time formats**
- Simulation parameters**
  - estimated activity duration
  - branch percentage estimates
  - cost and resource usage estimates
- Script expression syntax: JavaScript and other**
- References to external processes**
- Process lifecycle and version information**
- Web Service and EJB component invocation**
- Business Rule Invocation**

# Package Meta-Model



# Process Meta-Model



## □ **XPDL**

- WfMC will continue to maintain XPDL
- Will update based on
  - BPMN evolution
  - Implementers comments
- Have started an conformance community
  - Samples made available for testing interoperability

## □ **BPMN**

- BPMI has become part of OMG
  - BPMN will be further developed within OMG.

## *Finding XPDL and Related Information*

### **WfMC Website**

- <http://www.wfmc.org>
- <http://www.wfmc.org/standards/XPDL.htm>

### **OMG Website**

- <http://www.omg.org>
- <http://www.bpmn.org>

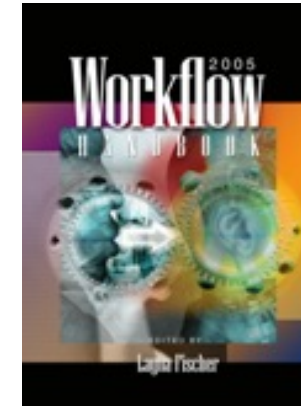
## *Finding BPMN / XPD L-Related Information*

### **Workflow Handbook 2003:**

- **XPDL and BPMN**  
Stephen A. White, SeeBeyond, United States
- **XPDL in Action**  
Arnaud Bezancon, ADVANTYS, France

### **Workflow Handbook 2004:**

- **Workflow Service Provider with XPD L**  
Arnaud Bezancon, ADVANTYS, France

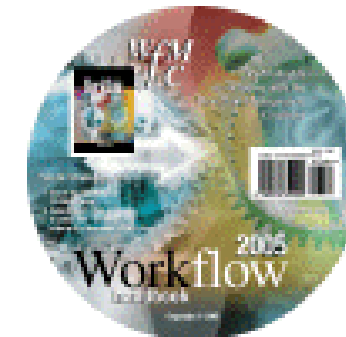


### **Workflow Handbook 2005:**

- **A Comparison of XML Interchange Formats for Business Process Modelling**  
Jan Mendling and Gustaf Neumann, Vienna University of Economics and Business Administration; and Markus Nüttgens, Hamburg University of Economics and Politics

### **NEW! Workflow Handbook 2006**

- **Available in May**



## *Summary & Next Steps*

### □ **Summary**

- BPMN is the most recognized standard for representing a business process & adopted by many vendors.
- XPD L is the most widely used format for exchange of process diagrams, adopted by dozens of process tools
- XPD L 2.0 includes support for all aspects of a BPMN diagram, while remaining compatible with 1.0.
- XPD L 2.0 is available today.

### □ **Proposed Detailed Tutorial on**

- Detailed semantics of BPMN elements
- Details on XPD L elements and attributes
- Examples of diagrams and XPD L
- Demonstration of BPMN design tools

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### **Question & Answer Session**

- To ask questions, please use the “Q&A” capability.
- Be sure to address the question to all panelists.

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- To download a copy of today’s presentation
- To download a ninety-day preview version of Fujitsu’s standards-based process modeler, Interstage Business Process Manager Studio