

**BPMI.org**

# **BPMI Notation Working Group**

## *Notation Concepts*

March 29, 2002

BPMI Document Number: NWG-2002-03-01  
Revision 3

## **Business Level Graphic Elements**

Our intent is that the Business Level notation be simple and adoptable by business analysts. Also, we have a conflicting requirement that the notation provide the power to depict complex business processes (business analysts actually can model something complex!). To help us keep the 2 (two) requirements clearer, the list of Business Level graphic elements is presented in 2 (two) groups.

First, there is the list of core elements that will help us meet the requirement of a simple notation. Second, there is the entire list of elements, including the core elements, which will help us meet the requirement of a powerful notation. We still have the challenge of putting it all together.

The following is a list of the core business process concepts that should be depicted through the Business Level notation:

1.0 Event

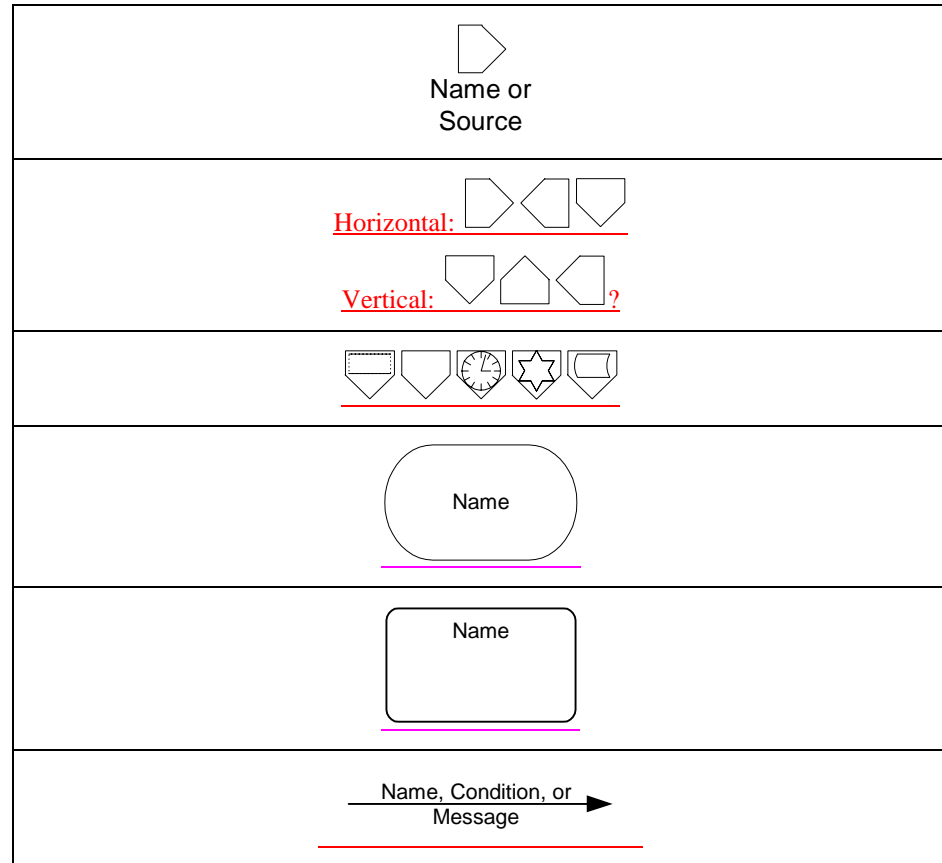
1.1 Control Flow Dimension (e.g., Start, Interrupt, End)

1.2 Type Dimension (e.g., Message, Rule, Time, Fault, Compensation)

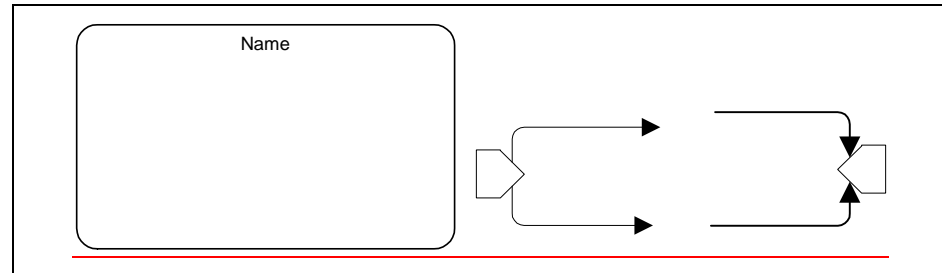
2.0 AtomicActivity

3.0 Sub-Process Object

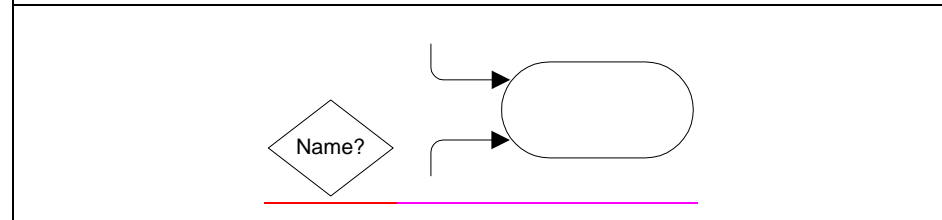
4.0 Sequence (Flow); Control Flow Link



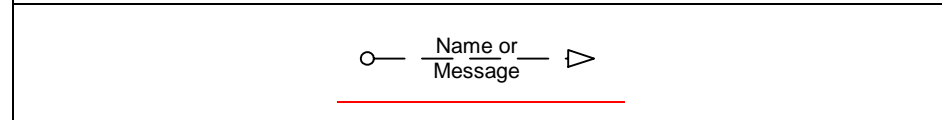
5.0 Forking/Joining (All)



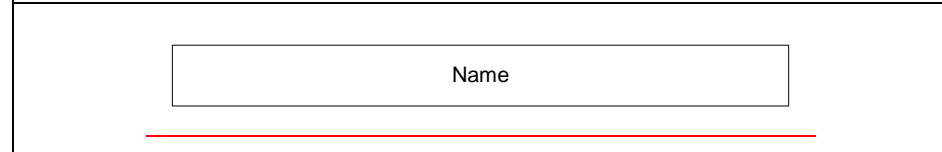
6.0 Branching Point; Decision/ Merging



7.0 Message Flow Link



8.0 External Entity



The following is a more extensive list of the business process concepts that should be depicted through the Business Level notation:

1.0 Event

1.1 Control Flow Dimension (e.g., Start, Interrupt, End)

1.2 Type Dimension (e.g., Message, Rule, Time, Fault)

2.0 Activity

2.1 Atomic (Action)

## 2.1 Internal

2.1.1 Send

2.1.2 Receive

2.1.3 Send and Receive

~~2.4 Receive and Send?~~

## 2.2 Global (Interaction – Choreography)

3.0 Sub-Process Object

3.1.1 Call (synchronous)

3.1.2 Spawn; Join (asynchronous)

3.1.3 Receive/Send Action with Call

~~3.2 Choreography (Global Model Activity)~~

4.0 Sequence (Flow); Control Flow Link

4.1 Normal flow

4.2 Exception/Compensation flow

5.0 Process Engine Instruction (other BPML atomic activities)

6.0 Message Flow Link

6.1 Message?

6.2 Document?

7.0 Forking/Joining (All)

8.0 Branching Point; Decision

8.1 Condition

8.1.1 Default

8.2 Bootstrapping Message

9.0 Iteration; Multiple Instances

10.0 Process Break (something out of the control of the process makes the process pause—fault, timeout, other events)

11.0 Process Break group/context (the group of activities affect by the break)

12.0 Transaction group/context (mainly open transactions; atomic transactions will probably not be appropriate)

13.0 Nested Process

14.0 Group (a box around a group of objects for documentation purposes)

15.0 Off-Page Connector (used within a page?)

16.0 Internal groupings; Swimlanes

17.0 External Entities

18.0 Participant Lanes (to highlight the Global Model)

The following is a list of BPML elements or concepts that are *NOT* specifically depicted in the Business Level notation (they will either be derived from the flow or be properties of other elements):

- 1.0 Empty
- 2.0 Assign
- 3.0 Data Mapping
- 4.0 Switch
- 5.0 Choice
- 6.0 Until
- 7.0 While
- 8.0 Foreach?
- 9.0 Sequence

## Notation Concepts

The following is a list of business process concepts that define the behavior and the relationships of the graphic elements listed in the previous section:

- 1.0 All Control Flow Semantics will be exposed in the notation—there will be no hidden semantics.
- 2.0 The [Business LevelBPMN](#) notation will-can depict, through a series of connected lines, the simple flow of control of a business process, from its start to its end, without any disconnected elements. The connected lines will be called control flow links. <<*This may be modified upon vote of the Working Group*>>
- 2.1 There will be only 1 (one) Control Flow Link connecting from (leaving) a given Activity.
  - 2.1.1 If there are parallel activities that follow, then there are 2 (two) options for depicting the situation:
    - 2.1.1.1 The control flow link can fork into multiple links. There will be no Fork Node to facilitate the forking. OR
    - 2.1.1.2 The control flow link will connect to an All Box that will contain the parallel activities. The All Box will have 1 (one) control flow link leaving the box.
  - 2.2 There *can* be more than 1 (one) Control Flow Link connecting to (entering) a given Activity.
    - 2.2.1 Each line connecting to an activity represents an alternative path into that activity.
    - 2.2.2 Parallel paths that would connect to an activity must be joined into a single link prior to connecting to the activity. There will be no Join Node to facilitate the joining. This can happen through a merging of connector lines or the use of an All Box that would have only 1 (one) exiting control flow link.

- 3.0 The Business Level notation will depict all other flow that is not part of the simple control flow. This means that fault, timeout, message, and compensation handling will be depicted.
  - 3.1 The control flow links for this type of flow will look the same as the normal control flow links.
- 4.0 Events that affect the flow of the business process will be depicted. All variations of Events (see below) will share the same basic shape.
  - 4.1 The starting and ending points of a business process will be represented and will be considered a class of Events.
  - 4.2 Events that interrupt the normal control flow will be depicted.
  - 4.3 The type of Event (e.g., message, timer, rule-based, etc.) will be depicted.
- 5.0 Activities will be divided into 4 (four) types:
  - 5.1 Activities (e.g., actions) will be distinguished from other BPML atomic activities and will be considered activities that are performed by the organization.
    - 5.1.1 There will be some indication about the type of action that is used. E.g., does the action send, receive, or both.
    - 5.1.2 An action *cannot* receive, and then send a message (a [business-process-sub-process object](#) does this).
  - 5.2 Sub-Process Objects (e.g., call, spawn, ~~and-join~~, [and ReceiveSend Action](#)) indicate that there is a level of drilling-down to a lower-level set of activities. *These objects will be graphically distinguished from atomic activities.*
  - 5.3 Process Engine Instructions (e.g., fault, compensate, timeout) do not have the same business meaning as Activities and Sub-Process Objects, *thus there should be a graphical distinction between them.*
  - 5.4 Global Activities represent activities that occur within a global or shared business process. Examples of these types of business processes are those defined by RosettaNet and ebXML BPSS. Note: BPML does not specifically support these types of activities yet.
- 6.0 Groups of activities that require event handling will have a graphic perimeter.
  - 6.1 The Event Anchor(s) will be attached to the Context perimeter in a location that is offset from the main flow of the activities
  - 6.2 A Control Flow Link, which is outside the normal Control Flow, will connect an Event Anchor of a Context to a set of activities that will handle the Event for that Context.
- 7.0 Groups of activities that require transaction handling will have a graphic perimeter (different from the event-handling perimeter).
  - 7.1 The Transaction Anchor(s) will be attached to the Context perimeter in a location that is offset from the main flow of the activities
  - 7.2 Atomic Transactions should be distinguished from Open Transactions through some graphic marker or text.


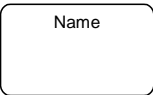
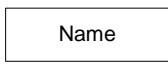



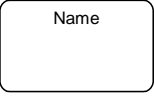
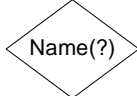
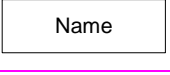

- 7.3 A Control Flow Link, which is outside the normal Control Flow, will connect an Transaction Anchor of a Context to a set of activities that will handle the compensation of the Transaction for that Context.
- 8.0 If a context is used for event-handling and that context has only 1 (one) activity, then there will not be a context box surrounding the activity.
  - 8.1 The Event Anchor(s) will be attached to the activity perimeter in a location that is offset from the main flow of the activities
  - 8.2 A Control Flow Link, which is outside the normal Control Flow, will connect an Event Anchor of a Context to an Event Handler set of activities for that Context.
- 9.0 External “participants” can be depicted.
- 10.0 Internal “participants” or groups can be depicted as Swimlanes.
- 11.0 Message Flow to external “participants” can be depicted. Messages to internal “participants” will not be depicted.
  - 11.1 The direction of message flow will be shown with a Message Link.
    - 11.1.1 This type of link will be distinguishable from the types of links.
    - 11.1.2 The contents of the message will not be depicted as a separate object, but will be associated with the Message Link.
    - 11.1.3 There will be a maximum of 1 (one) Message Flow Link connecting from (leaving) a given Action.
    - 11.1.4 There will be a maximum of 1 (one) Message Flow Link connecting to (entering) a given Action.
    - 11.1.5 There can be multiple Message Flow Links connecting to a Participant.
    - 11.1.6 There can be multiple Message Flow Links connecting from a Participant.
- 12.0 Nested processes, although disconnected from the main flow of control, should be represented and should be easily distinguishable from activity blocks and atomic activities.
- 13.0 There can be more than 1 (one) End object depicted on a model. However, this is used only as a notational convenience. There is functionally one 1 (one) End to the business process.
  - 13.1 An End may represent 1 (one) or more Results. There should be a mechanism for indicating the Result at the end of a business process.

## Connection Rules

## Control Flow Rules

The following table displays the graphical modeling objects of a process map and shows how these objects can connect to one another through Control Flow Links. The ↗ symbol indicates that the object listed in the row can connect to the object listed in the column. The quantity of connections into an object is specified in the column header with a code letter that precedes the graphical shape. The quantity of connections out of an object is specified in the row header with a code letter that follows the graphical shape. The code letters are: 0 (No Connections); 1 (One Connection); M (Multiple

Connections); and M(E) (Multiple Connections if the Connections are to/from exclusive alternative paths). Note that if a sub-process has been expanded within a diagram, the objects within the sub-process cannot be connected to objects outside of the sub-process. Nor can Control Flow Links cross a Participant Lane boundary.

From\To	<u>0</u> 	<u>M(E)</u> 	<u>M(E)</u> 	<u>M(E)</u> 	<u>0</u> 	<u>0</u> 	<u>M</u> 
 <u>M</u>		<u>↗</u>	<u>↗</u>	<u>↗</u>			
 <u>1</u>		<u>↗</u>	<u>↗</u>	<u>↗</u>			<u>↗</u>
 <u>1</u>		<u>↗</u>	<u>↗</u>	<u>↗</u>			<u>↗</u>
 <u>M(E)</u>		<u>↗</u>	<u>↗</u>	<u>↗</u>			<u>↗</u>
 <u>0</u>							
 <u>0</u>		<u>↗</u>	<u>↗</u>	<u>↗</u>			<u>↗</u>
 <u>0</u>							

## Message Flow Rules

The following table displays the graphical modeling objects of a process map and shows how these objects can connect to one another through Message Flow Links. The ↻ symbol indicates that the object listed in the row can connect to the object listed in the column. The quantity of connections into an object is specified in the column header with a code letter that precedes the graphical shape. The quantity of connections out of an object is specified in the row header with a code letter that follows the graphical shape. The code letters are: 0 (No Connections); 1 (One Connection in a single direction); M (Multiple Connections in a single direction). *Note that Message Flow Links cannot connect to objects that are within the same Participant Lane boundary.*

<u>From\To</u>	<u>0</u> 	<u>1</u> 	<u>M?</u> 	<u>0</u> 	<u>M</u> 	<u>0</u> 	<u>0</u> 
 <u>0</u>							
 <u>1</u>		↻	↻		↻		
 <u>M?</u>		↻	↻		↻		
 <u>0</u>							
 <u>M</u>		↻	↻		↻		
 <u>0</u>							
 <u>0</u>							

## Metamodel Conventions

1.0 TBD