

Business Process Modeling Notation (BPMN) – An Introduction to Process Diagrams

Object Management Group (OMG) is an organization that consists of international, neutral, open community-driven end-users, vendors, academics and government agencies who work together to develop specifications for standards which support recognized best practices. These '*de jure*' standards are generally recognized by international accredited standards bodies like ISO and ITU, and national standards bodies like BSI, JSA, AFNOR and ANSI.

One of the specifications that OMG has developed over the past 20 years is the standard Business Process Model and Notation (BPMN), available from their Web site: <http://www.omg.org/spec/BPMN/2.0>. This specification represents a consolidation of best practices within the business modeling community to define the notation and semantics of Collaboration diagrams, Process diagrams, and Choreography diagrams.

The primary goal of BPMN is to provide a notation that is readily understandable by all business users, from the business analysts that create the initial drafts of the processes, to the technical developers responsible for implementing the technology that will perform those processes, and finally, to the business people who will manage and monitor those processes. Thus, BPMN creates a standardized bridge for the gap between the business process design and process implementation.¹

It should be noted that BPMN does not support other types of business modeling done by organizations. The following are not considered 'in scope' for the notation:

- Definition of organizational models and resources
- Modeling of functional breakdowns
- Data and information models
- Modeling of strategy
- Business rules models

¹ OMG, "Business Process Modeling and Notation (BPMN) Version 2.0", 2011, p.1

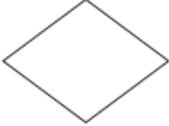
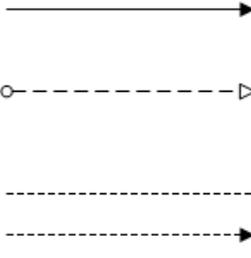
One goal driving the development of BPMN was to create a simple and understandable mechanism for creating process models, including the ability to express complex processes. Specific categories used to organize graphical aspects of the notation were defined to accomplish this goal. The result of this strategy provides a small set of categories so that any process model reader will be able to easily recognize the basic elements and understand the diagrams. The simple core objects can be extended to add variations and information to support complex processes while maintaining the simplicity of the diagrams.

The basic categories of elements used include:

1. Flow Objects - represented by three elements:
 - a. Events
 - b. Activities
 - c. Gateways
2. Data - represented with the four elements:
 - a. Data Objects
 - b. Data Inputs
 - c. Data Outputs
 - d. Data Stores
3. Connecting Objects - represent four ways of connecting the Flow Objects to each other or other information:
 - a. Sequence Flows
 - b. Message Flows
 - c. Associations
 - d. Data Associations
4. Swimlanes - represent the two ways of grouping the primary modeling elements:
 - a. Pools
 - b. Lanes
5. Artifacts - used to provide additional information about the Process; may include many different types of items.

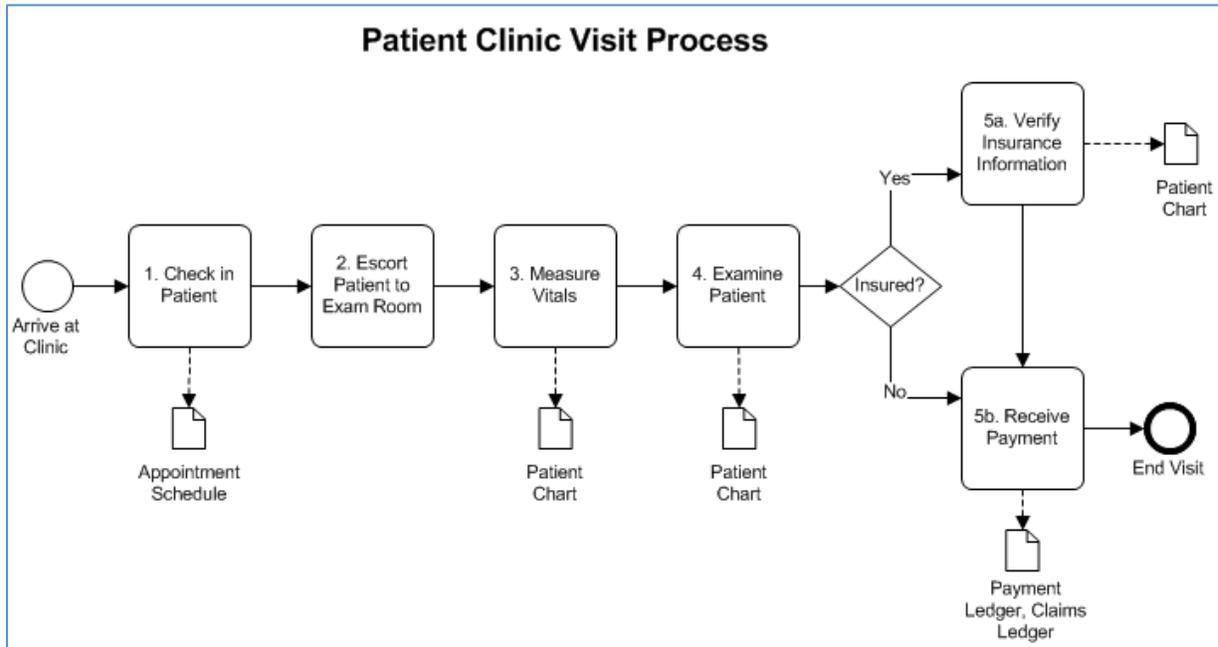
A list of the basic modeling notation elements used under the BPMN v2.0 specification follows on the next page. These elements can be extended using many other objects to allow modelers to add complex details and additional information. For example, solid and hollow arrows may be added to a Data Object to indicate an “Output” versus and “Input” object. Reference the [specification document](#) for other standard elements to extend these basic elements.

Basic BPMN Modeling Shapes:²

<p>Event</p>		<p>Start Event – begins the process.</p> <p>Intermediate Event – occurs during the course of the process.</p> <p>End Event – signals the end of the process.</p>
<p>Activity</p>		<p>Represents work that a business performs; may be a task or a sub-process.</p>
<p>Gateway</p>		<p>Controls the divergence and convergence of sequence flows in a process.</p>
<p>Flows</p>		<p>Sequence Flow – used to show the order that Activities are performed in a Process.</p> <p>Message Flow – used to show the flow of messages between two Participants in a Process (Participants are represented by separate Pools in a Swimlane diagram (Collaboration)).</p> <p>Association – used to link information and artifacts to other graphical elements; when the 'arrow' is attached to one end, it indicates data flow.</p>
<p>Pool</p>		<p>Represents a Participant in a Collaboration Process.</p>
<p>Lane</p>		<p>A sub-partition within a Process used to organize Activities.</p>
<p>Data Object</p>		<p>Information about Data Inputs/Outputs or what Activities are required to be performed.</p>
<p>Message Object</p>		<p>Depicts communication between two Participants.</p>
<p>Group</p>		<p>Used to group graphical elements into Categories; used for documentation or analysis purposes.</p>
<p>Text Annotation</p>		<p>Used to provide Model reader with additional information regarding the process.</p>

² OMG, "Business Process Modeling and Notation (BPMN) Version 2.0", 2011, pp. 29, 30

The simple example of a business process diagram below shows the high-level process that patients will go through when attending a clinic appointment. This diagram uses some of the basic shapes presented above. Note that the narrative below the diagram explains the activities that take place during the patient's visit to the clinic. Each activity is numbered, corresponding to the narrative, and all activity labels begin with verbs.



1. After arriving at the Clinic, the Patient is directed to the Receptionist to check for their appointment. The Receptionist records the patient arrival on the appointment schedule and notifies the staff that the Patient has arrived.
2. A Nurse or Aid will escort the Patient to an examination room.
3. Patient vitals (weight, blood pressure, temperature) are measured and recorded on the patient chart.
4. A Doctor or Physician's Assistant examines the Patient and records the information related to the purpose of the Patient's visit (diagnosis, medical procedures performed, etc.) on the Patient's chart.
5. The Patient checkout follows the examination.
 - a. If the Patient visit is covered by insurance, the Patient provides or verifies their insurance information and their records are updated with any new or revised insurance information.
 - b. The Check-Out station records the services that were provided in the Claims Ledger. The Patient makes their payment/co-payment and their visit is completed. Any payment made is recorded in the Payment Ledger.

The use of BPMN provides a simple way to make sure that documentation of a business process is accurate and complete. Because it is clear and straightforward, everyone with an interest in the process - the business analyst, technical developers, vendors and business people - can readily understand and validate the diagram. The diagram can provide the basis for creating other types of diagrams (e.g., data models, functional breakdowns, etc.), be used in determining and developing technical solutions and assist with the ongoing management and monitoring of the process at the business level.