Diagram types and data for BPMN modeling

The following diagram types and data are available for BPM modeling in Enterprise Studio.

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Process

A process diagram is used to describe the collection of activities on the path from a request for a product or service from a customer, and the delivery of that product or service to that customer. You model the behavior of a single process. The process diagram shows the order in which activities are organized, when and under what conditions activities should be executed, including exceptions. However, it does not show exactly how an activity is executed, and neither where nor why the activity should be executed.

A process runs from a starting point (start event) to and end point (end event), with possible occurrence of events between the start and end of the process (intermediate events and boundary events). Events are defined as something happening during the execution of a process. Events determine the course of the process flow and are usually the result of a cause (trigger), or exert some influence (result).

In between events, activities (tasks) are positioned. An activity can be broken down into underlying, lower level (more detailed) activities and in this way describe a sub-process (sub-process, transaction, call activity).

In the process model, relationships (sequence flows) are used to determine the order between the starting point, the activities, the intermediate events, and the end point. Moreover you can add splits, joins and repetitions of (parts of) the process with the use of gateways.

Example of a process

In order to describe who is involved in the execution of a process, lanes can be used. In this way, a lane can represent roles or organizational units that perform the activities in the process, or in other words, the participants of a process. A participant can represent the role of a person, but also systems or departments. The name of a lane is often the name of the entity that executes the process described in that lane, although in some situations it is more useful to use the name of the process.

The use of lanes, as well as the number of lanes to be used is up to you. These decisions depend on whether or not you want to add a responsibility aspect to your process.
A process diagram using lanes describes participants of the process from an internal perspective only. In order to also describe external participants, you should use the collaboration.

Collaboration

A collaboration diagram can be used to visualize the various participants of the process and their interactions. It describes the cooperation between the participants. A collaboration combines a number of individual processes.

Similar to process diagrams, a collaboration diagram consists of activities, sequence flows, and gateways. Also, participants of a collaboration are represented using lanes. In a collaboration however, they are classified as subdivisions of the rectangle in which the process is (pool). Similar to a lane, a pool can represent an organizational unit, a role, or a department.
Example of a collaboration consisting of two pools (processes)

Any external participants (e.g. the customer for which the process is carried out) can also be included, using a separate, empty pool. Within BPMN these pools are referred to as “black boxes”, as the details of the process of external participants are not further specified.

The interaction between participants in a collaboration is modeled using messages, the actual communication is visualized using message flows.
Choreography

A choreography is a type of process, but differs from an actual process in terms of goal and behavior. A process defines the ordered structure of activities within an organization or department. A choreography diagram visualizes the way in which participants coordinate their interactions. The focus is not on the orchestration of tasks performed by participants, but rather on the exchange of information among participants. An orchestration can also be considered as a business agreement between two or more organizations. This implies that the exchange of messages is executed in an orderly fashion.

The figure below shows an example of a choreography based on the earlier shown collaboration figure with the two pools "Pizza vendor" and "Participant". The following choreography maps out the exchange of information between the two pools.

Example of a choreography

Similar to a process, a choreography runs from a starting point (start event) to an end point (end event), with in between activities which are here called choreography tasks and call choreographies, and possible intermediate events. Also, activities can be broken down into underlying, lower level (more detailed) components and in this way describe a sub-process (sub-choreography). The starting point, the activities and the end point are connected by relationships (sequence flows) which describe the order of the process flow. Gateways can be used to indicate splits, joins and repetitions in the process flow.

Information

Data objects

The information used during execution of a process, like documents, files and other types of objects, can be represented using data objects in a process or collaboration. The data objects describe information that is updated and changed within the process, but does not influence the behavior of that process. Every data object sits within a specific process or sub-process, and its life cycle and visibility are limited to that (sub-)process. A data input can be used to specifically call out information objects necessary to start an activity, while a data output can be used to describe the (possible) outcomes/results of an activity.

Data stores

A data store represents a data structure from/to which a process can read/write, but will remain to exist after termination of the process. So it is a permanent location for data storage. Examples of a data store include a database, file cabinet or document management environments like SharePoint.

Associations

In Enterprise Studio the BPMN association and data association are considered the same and are called association. There is also only one symbol for it. An association is used to connect a data object with a flow object, or to connect two data objects. An association that is connected to an activity or event provides a connection to the data input or output of this activity or event. With this you can also indicate the direction.
Resources and resource roles

In the BPMN language, resources and resource roles describe the resources to which activities in a process or collaboration can refer. A resource executes an activity, or carries the responsibility for it. A resource, for example a performer, can be specified in the form of for example a person, or a group of persons, but also an organizational role, a software application. An activity is, for example, performed by means of a work instruction. An example of this may be a work instruction that an installer uses to install a television for a customer.

A resource role is a more detailed specification of a resource. From a process of collaboration references can be made to these resource roles.

BPMN does not visualize resources and resource roles. Enterprise Studio does offer the possibility to visualize them by using a resources diagram. This resources diagram is used to describe various resources and their roles.

As a next step, resource roles can be assigned to activities in a process or collaboration, but also to pools, lane sets, and lanes.
Example of a process with resource roles assigned to activities

**Difference between resources and participants**

A resource is different from a participant. Depending on how the two concepts are used, the difference may be unclear, but in general it is the case that a resource defines the resource that is responsible for the execution of an activity. A participant is defined within the context of a collaboration and only has meaning within this context. A participant is responsible for the execution of a single process (pool) within the collaboration. A process is one of the participants, the other pools in the collaboration form the other participants.

**Items**

Although items are not defined as part of the BPMN specification, they are included in Enterprise Studio as an extension to it. Items can be used to describe different types of data storage and information flows that are used in a model. A separate diagram/visualization for items is not available, but they can be added to diagrams that include data stores and message flows. You can create items at the same time while creating a data store or message flow. Alternatively, you can create and add items to the model browser prior, and then use them later when creating a data store or message flow. Once an item is created and available in the model browser, it can be reused indefinitely in process and collaboration diagrams that are part of a BPMN model.

The process in the figure below includes a data store "Order status", as well as two message flows "Order" and "Status update". The items are shown as the names of these objects, while the actual item objects can be found in the model browser.

**Global tasks, partners and other domain**
The following data are not part of the BPMN specification, but can also be used in BPMN modeling:

- *Global tasks* to denote generic tasks which can be invoked by a process or collaboration, but do not need to be defined in more detail.
- *Partners* to model partner entities and partner roles. These partners represent the participants in a collaboration.
- *Other domain* for the import of objects from domains not covered by BPMN, which can be related to BPMN objects.

Of the diagrams and data mentioned, the focus is set on the process, collaboration, choreography, resources and items. Other elements will not be discussed here.