Introducing BPMN symbols with the example

3.1. Symbolizing in BPMN Modeling Language

Process modeling can be perplexing without a united and integrated procedure for process documentation understanding them may be difficult for someone who is not involved directly in mapping and modeling. Modeling and symbolizing the business processes (BPMN Modeling language) is one of the most applicable business process modeling techniques and aids the process modeling understanding for all involved people (Staff, Manager, consultant, and so on). This method is a real one to process mapping and is also a standard and identified method in the world. On the other hand, it is the knowledge that each business should be aware of that for its processes along with the trustable mapping. When you model the processes in the standard way like BPMN modeling languages you will be able:

- To obtain the accurate view about performance way of whatever exists in your business
- To save your time by excluding unnecessary things
- To decrease forgetfulness rate, ignoring some cases or inappropriate implementation by staff

3.2. BPMN Modeling Language Symbolizing and Element

BPMN models are stipulated by simple graphs that are constructed from the graphic elements. This graphic element makes the flow understanding and business process procedures simple both for business users and developers. Four elements of the BPMN modeling are as follows:

1. Flow objects: Events, activities, and gateways.

2. Connecting objects: Sequence flow, message flow, and association.

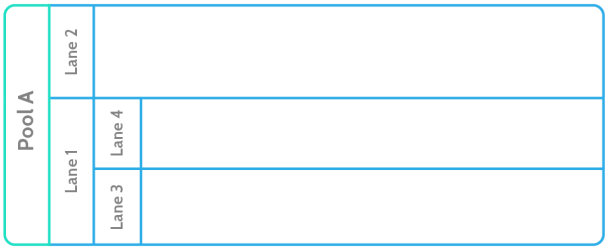
3. Swim lanes: pool, lane.

4. Artifacts: date object, group, and annotation.

These four elements facilitate the business process diagram (BPD) creation. Moreover, BPD provides making new types of flow objects or artifacts to make the diagram recognizable. Later we will address four elements.

Lane and Pool

The related page to mapping in BPMN modeling language includes pool and lane.



Pools are emblems of various organizations with the separated processes. Lanes show teams or various people of an organization pool. They are places that include lanes, events, and tasks. Pools indicate the people who will take the responsibility to do the various tasks. For example, if we are supposed to map the supportive process from our customer, there will be one pool for street road and one for the customers.

In this status, the work can flow between pools and show the message transmission. The precise utility of pools and lanes are related to the tastes in BPMN modeling language. There are some powerful and firm rules for the case either you use diverse pools for various parts of the agency in the organization, or you utilize solely one lane.

. Each pool can have a maximum process.

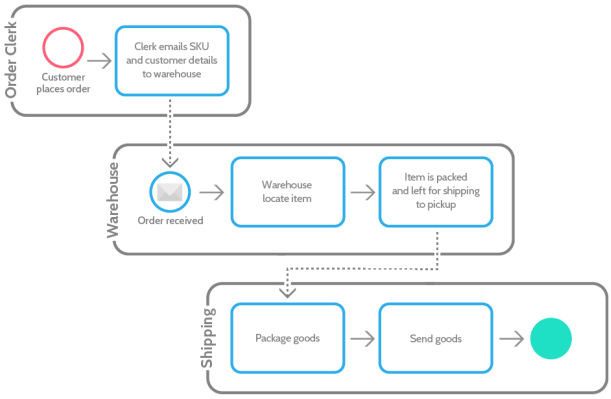
. Pools are the representative of the various companies: Companies, customers or parts.

Lanes

Typically processes need two or some departments to cooperate with each other. As an instance one process of simple order reach is as follows:

- Customers order by credit card or by phone. This stage is shown under the title of the Customer Place Order.
- Ordering part secretary recharges credit card.
- The secretary jots down SKU and customer details.
- The secretary emails the SKU and details. It's demonstrated as the clerk emails SKU.
- The considered item is packed and labeled. These activities are shown as Warehouse in one pool.
- The shipping part dispatches it to the customer. These activities are demonstrated as shipping in the pool.

This process is drawn like the table below in the BPMN modeling language.



3.2.1. Flow objects in BPMN

Previously it's said that one of the BPMN graphic elements is flow objects. Flow objects in BPMN include Events, Activities, and Gateway.

1. Activities: One activity in BPMN can be considered as a <<Work>> that one company or organization conducts during the business process.

The Activity can be decomposable (Task) or composable (Sub-process). Indeed, there are three types of activities in BPMN.

- Task
- Sub-process
- Call Activity

Later we will address the types of activities comprehensively.

Tasks in BPMN

Each task is one of the object flows in BPMN and one decomposable activity belongs to one process. Whenever we can't divide one activity into a level with details, one task has been created virtually. People or applications implement the tasks. In BPMN 2.0 there are multiple tasks that are utilized in a more particular presentation.

The tasks are as follows:

- Service Task
- Send Task
- Receive Task
- User Task
- Manual task

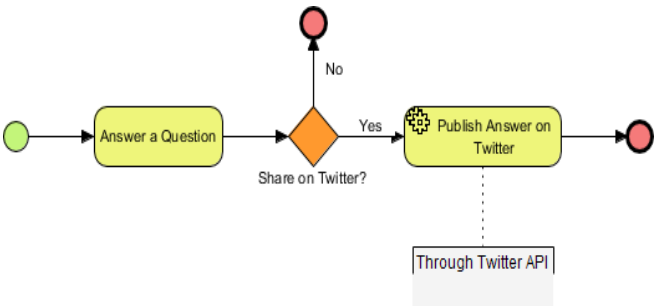
- Business Rule Task
- Script task

In the following sections, we will address each of these types of tasks that are part of the flow objects in BPMN and will present an example for each.

Service Task

Service is a task that utilizes a web service, automatic program, or other types of service to do the work.

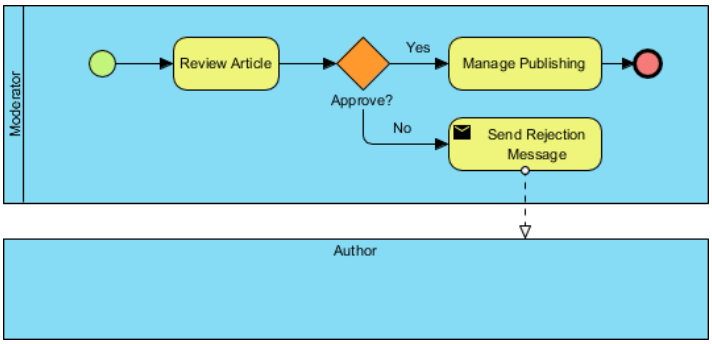
The example below shows the resource to one question in one information exchange website. Each service task is used to show Publish Answer to Twitter.



Send Task

Send is a task that sends the message to one other Lane or Pool. After sending, the task is done.

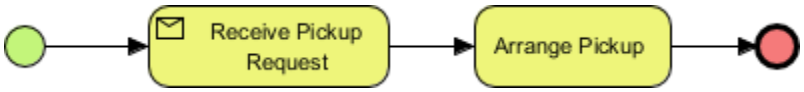
The example below presents the acceptance process of one article one sends rejection message is utilized to show the creation and rejection from moderator to author.



Receive Task

Receive Task has been one of the flow objects in BPMN and shows that process should wait for a message to continue. The task is completed after receiving the message.

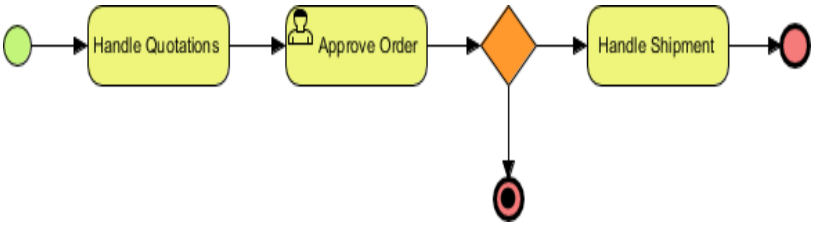
The example below shows the Receive Task utilizing in pick up delivery management. Receive pick up request will be activated only upon receiving the message. In this case, the considered message is a pick up request.



User Task

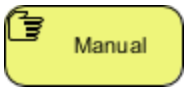
User Task is the next object flow in BPMN and indicates that one human executive can do the work by utilizing a software application.

The example below shows the ordering process. The User Task is used to show the Approve Order. Approve Order is constructed by customer (Human executive) and by purchasing system cooperation. (Software Program)

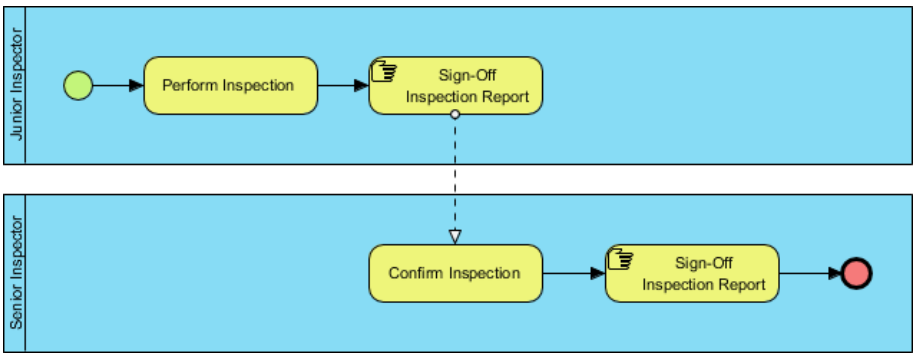


Manual Task

One manual task is a task that is done irrespective of any kind of business process implementation motor help or any type of application.



The following example shows basket inspection. Both tasks related to the sign-off are manual tasks that are conducted without any process implementation motor or software help.



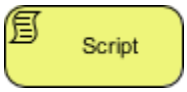
Business Rule Task

Business Rule Task has been recently added to BPMN 2.0. This type of flow object in BPMN provides a mechanism during which the process prepares the process input for the business rule motor and the presented outputs receive the business rules by the motor itself.

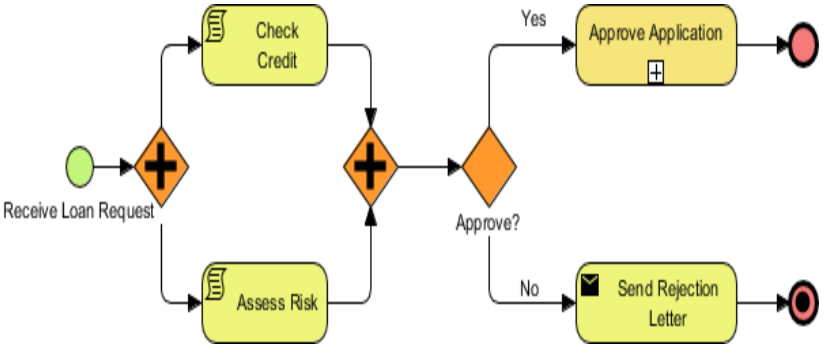
The next example shows analyzing the result of the surveys. It is expected that one business rule motor is used in the collected data analysis and later the produced analysis results be utilized.

Script Task

Script Task is another example of the flow object in BPMN and is implemented by the business process motor. This task defines a set of instructions that process motor can interpret. By task commence the motor will implement the script. After script termination, the task is done.

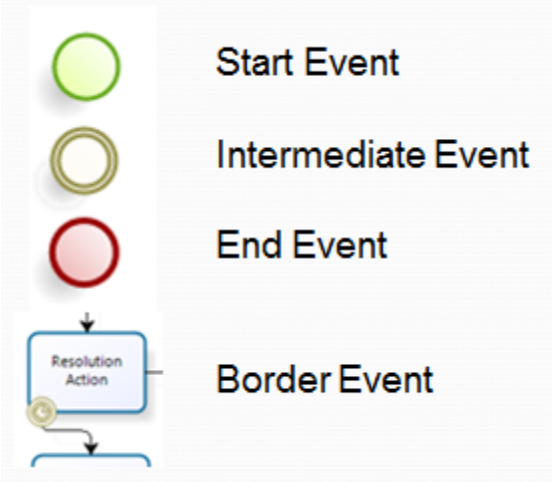


The instance below shows the loan request process. Script Task is utilized for the supplier check credit or is done for implementing a pre-made script.

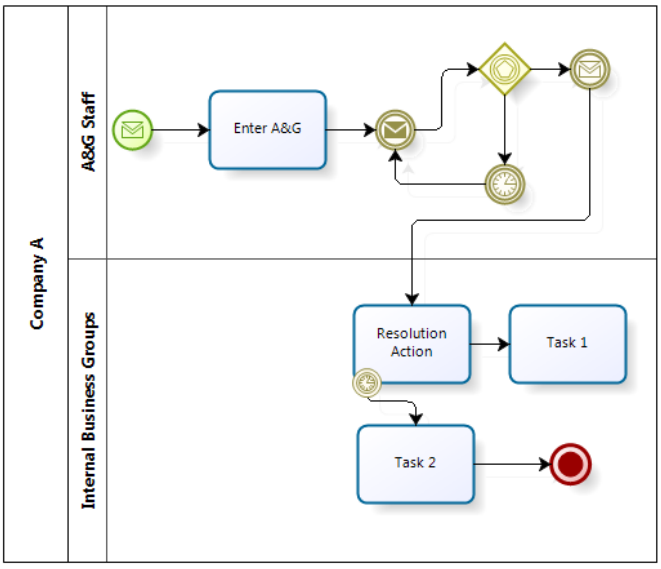


3.2.1.1. Events

The next series of the flow objects in BPMN are Events that are presented in a circular shape. The Event shows some happenings that take place in the beginning, end, or during a process (Despite when one work or activity is being done). Events that take place at the beginning of the process are called start events and each process begins with one event. By the same token, end events are the ones that happen at the event of the process and each process has at least one End Event. The Events that take place in the middle of the process (between processes) are called Intermediate Events.



The Events can take place during one process as well which are called Border Events. As an instance, you may determine a deadline for one work. The stipulated due time will be demonstrated as Time Event for one human task activity. A symbol will be added to the circle center to show the <<Type>> of the flow object in BPMN. For example, one ring with an example shows the message that can present receiving the email. Moreover, the Events own catch and throw characteristics. This case has been added to the BPMN 1.1. standard version which is specified in a black icon or white. Receiving the message can be an Event that<<waits>> to get the message and Throw Events consigns the message. In the example below, utilizing the method of this flow object in BPMN is shown. The first Event with the white icon is one Start Event. Upon receiving the email, the process example starts and the next activity takes place to enter the A & G.



After putting an end to the Enter A & G task, one intermediate task (message throw with the black icon) takes place. This event sends an email. Now the process in the Gateway is reliant on

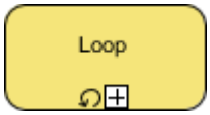
the expecting event so that one or two Events are likely to happen. The falling path of the gateway toward an Intermediate Event (a timer, taking) happens. The process will wait for a particular time. The process will send another email upon expiring the timer. If the shown message is received with the Intermediate Event (message taking) the process will go on. If we suppose that we have received the message the process will move toward the resolution Action. This step includes a Border Event (a timer, taking). Therefore, if it expires the task moves to task 2.

Sub-process

Another type of object flow in BPMN which is the sub-category of the activities is the sub-processes, is synthesized activities, and shows a set of other tasks and sub-processes. By and large, the BPMN diagram is created so that we can relate the processes with each other. We don't want to have a complicated business process diagram to facilitate the information. You can divide one complicated process into several levels by using sub-processes.

As a result, you will be able to concentrate on a particular place in one process diagram. The type of the indicator has been specified for this kind of flow object in BPMN. Four indicators are as follows:

1. Loop: Sub-process with the loop indicator means that the sup-process repeats itself frequently.



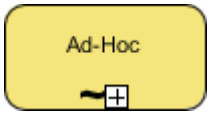
2. Multi-Instance: One sub-process with the Multi-Instance indicator shows the sub-process that can be implemented simultaneously with the other similar processes.

3. Compensation

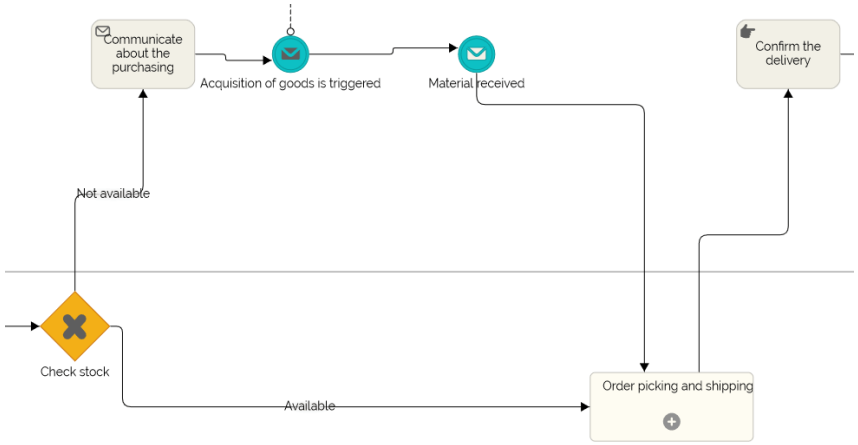
The tasks that we do in our processes should be canceled in some particular circumstances. Some examples of the object flow in BPMN are as follows: Train or plane ticket reserve, renting a car, and credit card charge. In these cases, compensation is utilized.

4. Ad hoc

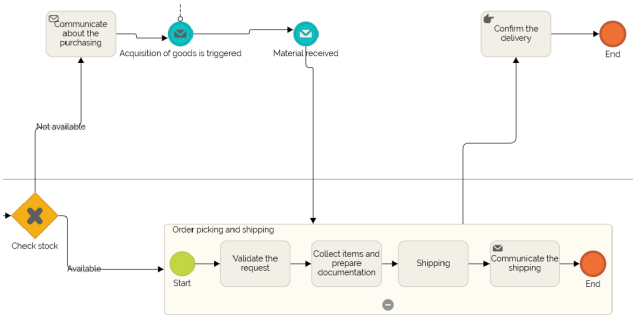
A sub-process with ad hoc indicators is a set of works that exist solely to control a particular case. This set of activities lack any required sequence and may take place in any order.



Suppose you have designed one process flow for material requests and there are order picking and shipping in some cases. In the diagram below we present this stage with one sub-process.

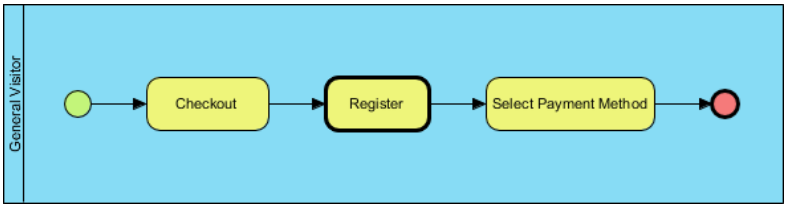


We can observe the flow objects in BPMN widely by clicking on the existing positive sign on the sub-process icon:



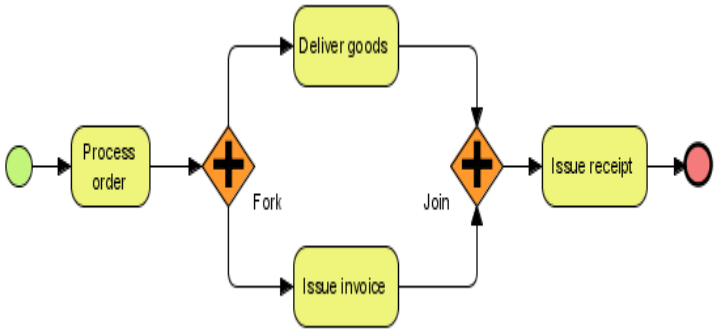
Call activity

Call activities are one of the flow objects in BPMN and return to a pre-defined activity in the process which is out of the current process. This will enable you to create a process definition that is reusable.
The graph below presents one sample of the call activity in BPMN. This is the Call Activity Register that refers to the Register task in the defined global process.



3.2.1.3. Gateways

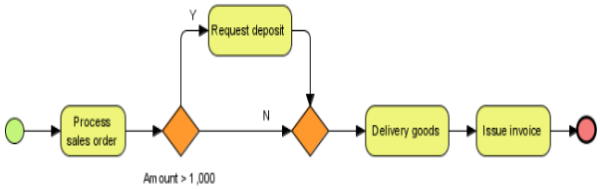
Gateway is the next flow object in BPMN and is utilized to control the process flow. Indeed, the decision-making point about what should be done in the future is called the Gateway. At this point, we decide based on the existing data and pursue solely one path which is called XOR. Bear in mind that the Gateway is not a task. Facts and needs must be specified prior to gathering a Gateway. The types of the Gateway are as follows:
1. Parallel Gateway: One Parallel Gateway is utilized to visualize simultaneous activities. The process has been divided into some parts after reaching the Parallel Gateway tie and is connected on the verge of the connecting Parallel gateway. In the example below, two Gateways are utilized to conduct the good delivery process and prepare the bill simultaneously.



2. Exclusive Gateways

Exclusive Gateway is a detracting point of the business process's main flow. Only one current path is traced for one particular example of the process. Look at the diagram below. If the

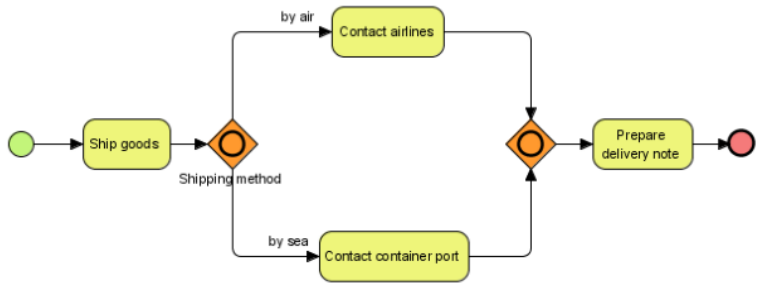
ordering cost is much than 1000 the customer is required to pay. If the cost is 1000 or less than that we deliver the goods directly. There are only two feasible paths for the process which one of them is implemented now two.



3. Inclusive Gateways

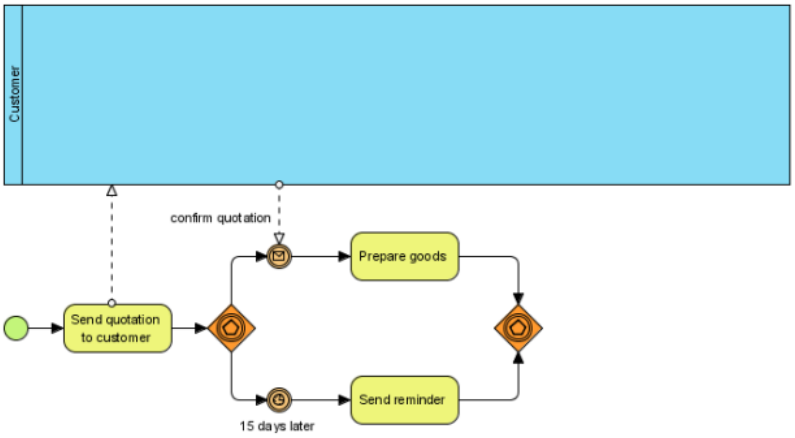
Inclusive Gateways are particular types of flow objects in BPMN and show one divided part of the business process. Unlike the Exclusive Gateway, Inclusive ones may simulate more than one exit pattern. Therefore, the investigating project will defer from the Exclusive Gateway. All output conditions will be evaluated irrespective of the output path whether is on the flow or not. In the process diagram, one utilizing example for the Inclusive Gateway has been presented. The possible paths are as follows:

- Delivering all the goods by air
- Delivering all the goods by sea
- Delivering some by sea and some by air respectively



4. Event-Based Gateway

Event-Based Gateway is alike the Exclusive gateway but the Gateway trigger is based on taking place an Event rather than evaluating the status. When our process got to the Event-Based Gateway we will wait till the Event happens. This Event is typically done by a third party (for example the customer who should pay). One Event-Based Gateway has been presented in the table below. We will send a "Quotation" to the customer. If the customer confirms, we will prepare the goods. If we don't get any confirmation after 15 days we will send a reminder.



The various types of flow object in BPMN and the way of their utility has been stipulated in this E-book. Later you will get familiar with two other types of the main elements and four BPMN modeling standards which are Connecting Objects and Artifacts.

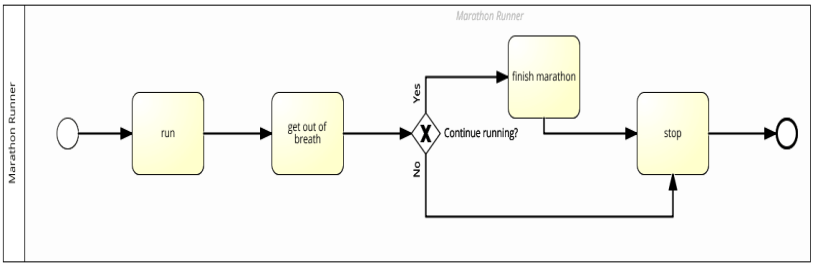
3.2.2. Connecting Objects

BPMN modeling standard uses three various Connecting Objects to show the activity flow. These objects show the activity relationship and are as follows:

1. Sequence Flow: Are the main levels that connect your map elements. These lanes connect the activities Events and Gateways and are critical for the activity connection. Your map lacks credibility without Sequence Flow. The Sequence Flow is shown with the filled line and arrow. The arrow direction shows the Sequence Flow order.

You can also use the Sequence Flow to connect the current flow element in one pool: In the pool or similar lane or between the lanes of one pool.

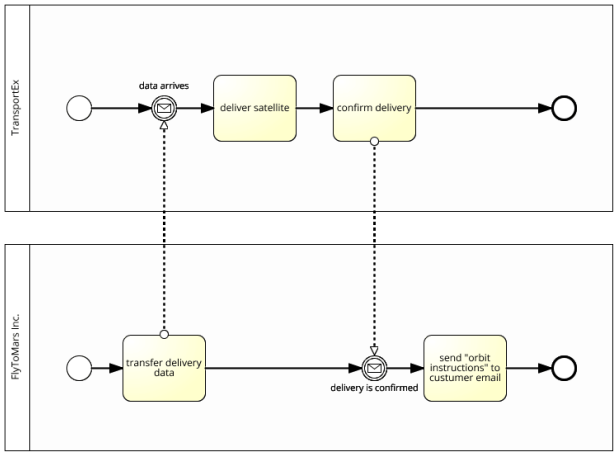
If you intend to connect the current element in various pools you can use the Sequence Flow. You should use the message flow for this.



2. Message Flow

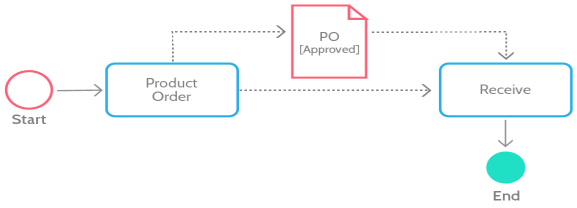
It's applicable when the companies and various organizations send information to each other. When you are eager to do a task you aren't disposed to go to various parts and supervise the work. The Message Flow doesn't show a precise step but a request or information share. This is only a flow that can be taken place between the pools and lanes (organization or company). Each input message is received by catching the Event.

In BPMN modeling standard the relationship between the pools is received by using the message. The Flow message is shown by the dotted arrow. Some of the messages that are among the pools are as follows: Fax, telephone, email, letter, notice, and command.

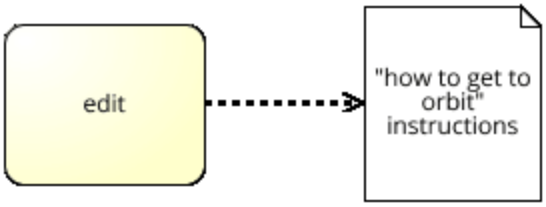


In the example above, sending process of the delivery package is drawn by the BPMN modeling standard. The package delivery addresses are presented from the order website. Later you confirm the package entrance by sending a message to the website after receiving the package.

3. Association: Associations are utilized to specify the information that isn't related to the process flow. These elements can't be implemented and will be useful for business process analysis legibility. Association will be applied to connect the document, information banks, and the other results to the processes.



In the BPMN modeling standard, the textual annotation will connect the data cistern, data object, and BPMN extra elements and IT system to your process flow. Association can have the direction. (have Flashpoint) that shows access existence to read and write.

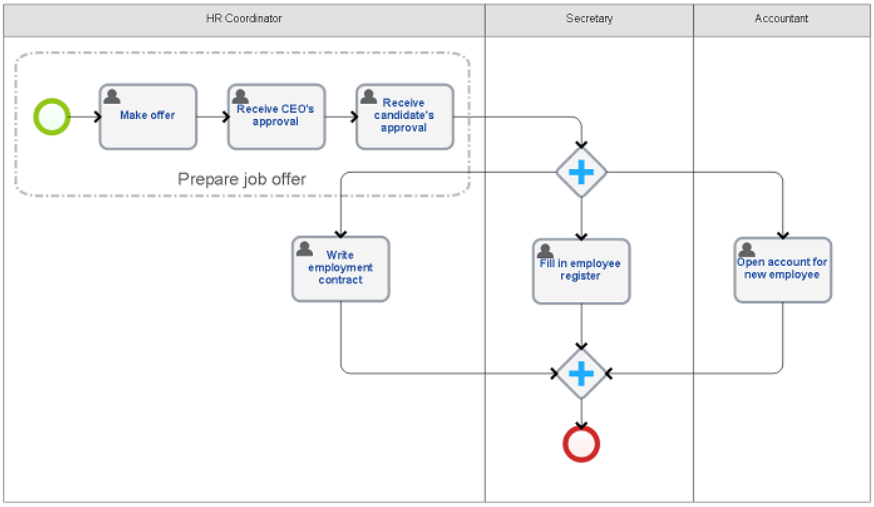


3.2.4. Artifacts

The last but not the least element of the modeling standard in BPMN is Artifacts. Artifacts present mechanisms to add qualitative information about the process. Two types of common Artifacts are Group and Annotation. (Data objects belong to the Artifacts in BPMN 1.2 version but in 2.0 they are separate Groups)
However, the BPM system developers can add the required Artifacts.

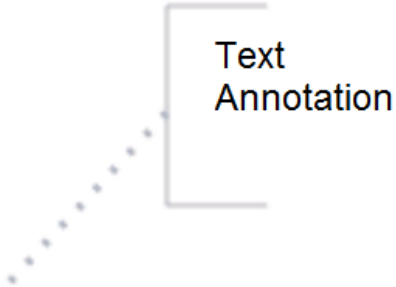
- Group: Graphic-wise the group is presented in a circle rectangle which its borders are specified by a line dot. The Group surrounds the group of the flow objects, and classifies them but it won't have any impact on the process function.

The activities can be specified by this so that we can present that they are related and can be categorized to analyze or prepare the document.

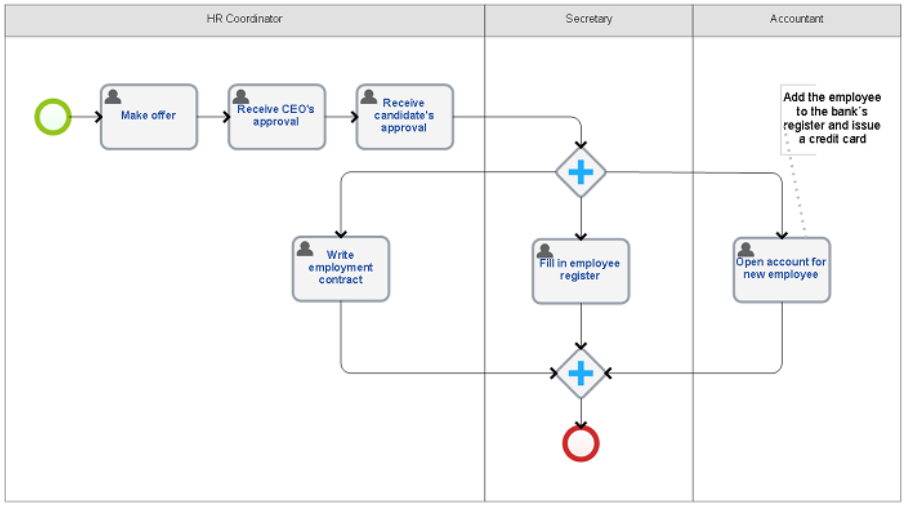


The Group is not a "Sub-process" or a "Task" in BPMN modeling standard. It's not an element of the Sequence Flow like the Gateway. Therefore, you can connect a Group to one Sequence Flow or message Flow. Nevertheless, the Groups can specify the activities belonging to the various pools and can be used to show B2B relationships since they are not restricted to the pool and lane.

- Annotation: We will review the up-coming Artifacts sub-categories of the BPMN modeling standard that is Text Annotation. The Text Annotation permits the model maker to add some qualitative information notes to the diagram. As an example, element definition, way of using, ideas and explanations. All these cases aid the diagram information content and will facilitate the process understanding for the user. Graphically Annotation is like an open box that the text is in both sides.



You can connect a Text Annotation by using one association as a particular element without its impact on the process flow.



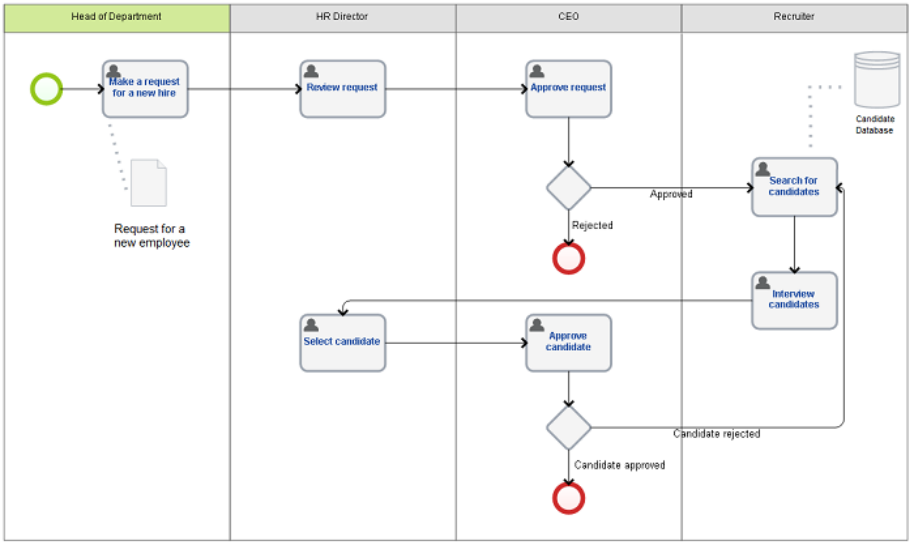
We should be sure that the utilized data during the process are collected and managed in modeling the business process. BPMN modeling standard presents a type of technical element that provides the saving and process component transmission possibility during the process implementation for you: Data object and Date storage.

Typically the elements are tied with the process function. Graphically, the Data object is presented in a document form with the folded angle.

Data object presents the input and output of the Activities and won't influence the process procedure.

Data objects exist solely at the start and end of the process. If one process example is canceled the next Date object will be inaccessible for each external process. Unlike the previous version, BPMN 2.0 introduces Data storage which provides the information save possibility even after finishing the stage example. Data storage graphically is presented like below:

In the diagram below which presents the new employer hiring process, the Data object is utilized for the Request of the new employer, and data storage is utilized to save the candidate database.



All in all, you got familiar with the main BPMN modeling standard by ending this chapter. You can send an email to the book author and get the E-book to be familiar with the other elements.