

BPMN Quick Reference Guide

Swim Lane:

A swim lane is a visual mechanism of organizing different activities into categories of the same functionality. Two notations are used to organize activities: Pools and Lanes.

Pool: acts as a graphical container for partitioning a set of activities from other Pools. It contains Events, Activities, Gateways, Connecting Objects and Artifacts.
Lane: used to organize and categorize activities within a Pool. A Lane is represented as a sub-part of the pool.

Event:

An event affects the flow of the process and is usually associated with a "Trigger" that defines the cause of the event. There are three types of Events, based on when they affect the flow:
Start Event
Intermediate Event
End Event

	Start	Message	Timer	Error	Cancel	Compensation	Rule	Link (Go-To)	Multiple	Terminate
Start	○	Ⓜ	⌚	⚠	✖	⏪	⚖	➡	⊛	⊛
Intermediate	○	Ⓜ	⌚	⚠	✖	⏪	⚖	➡	⊛	⊛
End	○	Ⓜ	⌚	⚠	✖	⏪	⚖	➡	⊛	⊛

Connecting objects:

Sequence Flow:

A Sequence Flow shows in which order the activities will be performed. Sequence flow may be:

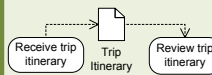
- a) Conditional Flow:
- b) Default Flow:

Message Flow:

A Message Flow is used to illustrate what messages flow between two process participants (Pools). Sequence Flow is not allowed between Pools.

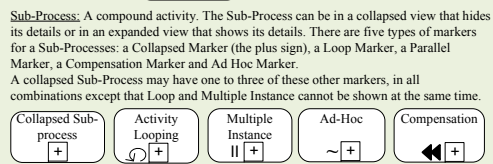
Association:

An Association is represented with a dotted line. An arrowhead may be added to indicate the flow direction. Associations are used to associate an Artifact, data or text to an Object. A directional Association is used to show that a Data Object is either an input to or an output from an activity.



Activity:

An activity is a generic term for work to be performed. There are two Activity types:
Task: An atomic activity. There are three types of markers for a Task: a Loop Marker, a Multiple Instance Marker and a Compensation Marker. A Task may have one or two Task Markers.
Sub-Process: A compound activity. The Sub-Process can be in a collapsed view that hides its details or in an expanded view that shows its details. There are five types of markers for a Sub-Process: a Collapsed Marker (the plus sign), a Loop Marker, a Parallel Marker, a Compensation Marker and Ad Hoc Marker.
A collapsed Sub-Process may have one or three of these other markers, in all combinations except that Loop and Multiple Instance cannot be shown at the same time.



A Transaction is a Sub-Process that is supported by special protocol that insures that all parties involved have complete agreement that the activity should be completed or cancelled.
A Transaction has three outcomes: **Successful completion:** this will be shown as a normal Sequence Flow that leaves the Sub-Process.
Failed Completion (Cancel): When a Transaction is cancelled, then the activities inside the Transaction will be subjected to the cancellation actions, which could include rolling back the process and compensation for activities. **Hazard:** This means that something went terribly wrong and that a normal success or cancel is not possible.

Gateway:

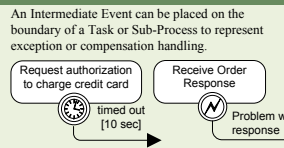
A Gateway is used to control the divergence and convergence of Sequence Flow. Thus, it will determine branching, forking, merging, and joining of paths. Internal markers will indicate the type of behavior control. There are five types of gateways:

XOR - Data-Based exclusive decision and merging. Shown with or without the "X" marker.	◇	⊛
XOR - Event-Based exclusive decision and merging.	⊛	⊛
Inclusive (OR)- inclusive decision and merging.	⊕	⊕
Complex -- complex conditions and situations (e.g., 3 out of 5)	⊛	⊛
Parallel (AND) -- forking and joining	⊕	⊕

Artifacts:

Artifacts allow modelers to add information into the diagram so it is more readable. There are three Artifacts types:

Group: The Group is used to group different activities but does not affect the flow in the diagram.	
Data Objects: Data Objects show the reader which data is required or produced in an activity.	
Annotation: An annotation is a way for the analyst to convey additional information to the reader of the model!	



BPMN Learn by Example

The BPM model shown is for a Travel Agency that receives the customer's trip criteria and displays matching flight and hotels. Once the customer makes a selection, the agency charges the customer's credit card and books the flight and hotel. An itinerary is sent to the customer and a link to the airline check-in website is sent to the customer 24hrs before the trip date. The modeler follows the 6 steps shown below:

I. Define the Process Participants (Pools):

Start by defining the process participants. In the example shown, there are three participants: The Customer, The Travel Agency and the Financial Institution. The process is developed from the point of view of the Travel Agency, hence, the Customer and the Financial Institution are considered as external Participant who will be communicated with using messages. Each Participant is represented as a Pool.

II. Define the level of activity detail to show within each Pool:

If the activities performed by a participant are irrelevant and instead the process is focused on the messages exchanged with the participant, then the process model shows minimal (like in the case of the Financial Institution) to no activities (like in the case of the Customer) within that Pool.

III. Define how to categorize the activities within each Pool:

Since it is necessary to distinguish between the automated activities performed by the Travel Agency's website and the manual activities performed by the Customer Service dept, the two are shown as two Lanes within the Travel Agency Pool.

IV. Define the activities that lead to a successful end:

Note: the following steps correspond to the steps in the BPMN diagram below

1. Define the starting event of the process. The process starts when the web site receives a message from the customer with the desired flight and hotel room criteria. (flight dates, no. of stops, no. of nights, hotel rating, etc). (BPMN: Start Message Event)
2. The web site performs two sub-processes simultaneously (in parallel) to retrieve the flights and hotel rooms that meet the customer criteria. (BPMN: Parallel Expanded Sub-Process)
3. The Web site presents the available flights and hotel rooms to the customer.
4. The website decides the next step based on the event that will take place, which will be one of three: a) no customer response for 15 minutes (which may make the displayed flights and hotel rooms obsolete), b) the customer requests to continue booking with a selected flight and hotel room, and c) receive the customer's request to cancel. (BPMN: Event-Based Gateway)
5. In the happy path, the process will receive a message from the customer with a request to continue booking for selected flight and hotel room. (BPMN: Intermediate Message)
6. The website requests and gets the customer's credit card information.

7. The website requests authorization from the Financial Institution to charge the customer's credit card. (BPMN: Task with a possible Time-out Exception Flow). Execution within the Travel Agency's lane is paused (step 9) waiting for a response from the Financial Institution.

8. The Financial Institution processes the authorization request.
9. The Financial Institution sends back the authorization request response.
10. The paused website receives the response and continues execution.
11. The website evaluates the response received (BPMN: Data-Based Decision Gateway).
12. In the happy path, the credit card charge is authorized. (BPMN: Default Flow)
13. The website performs a transaction that includes two activities: booking the flight and booking the hotel room. The Transaction insures that all activities are completed successfully or all of them will be cancelled. (BPMN: Transaction).
14. In the happy path, the booking is successful for both.
15. The website prepares the trip itinerary.
- 16a. The website emails the trip itinerary to the customer.
- 16b. At the same time (in parallel), the Customer Service dept mails the paper itinerary to the customer's physical address.
17. The process continues when both itineraries are sent to the customer. (BPMN: Parallel Join)
18. The website closes the order.
19. The website waits until 24 hrs before the trip date.
20. The website emails the customer a link to the airlines check-in website. (BPMN: Sub-process with Activity Looping)
21. The process ends successfully.

V. Define the alternate paths that lead to a successful end:

First Alternate Path: At step 7, if the request to authorize the credit card times out (more than 10 seconds), then the flow is routed to steps: 22, 23, 24, 8, 9, 25, 26, 27, 28 and resumes at step 15.

Second Alternate Path: At step 13, if booking fails for the first, second or third time, then the flow is routed to steps: 29, 30, and resumes at step 13.

Examine the model to find more alternate paths.

VI. Define the exception paths that will not lead to a successful end:

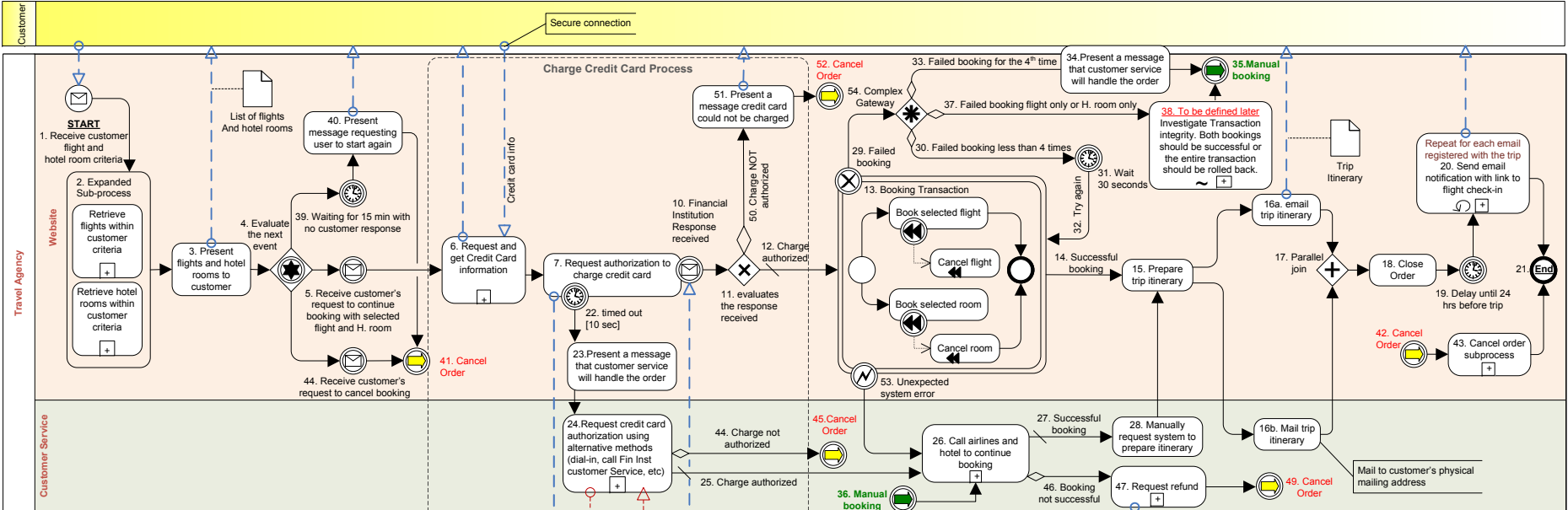
First Exception Path: At step 4, if the system waits for 15 minutes without receiving a response from the customer, the flow is routed to steps: 39, 40, 41, 42, 43 and 21.

Second Exception Path: At step 11, if the credit card charge are not authorized, the flow is routed to steps: 50, 51, 52, 42, 43, and 21.

Examine the model to find more alternate paths.

Note about notations colors and line styles:

- A notation MAY use any line colors to suit the purpose of the modeler or tool (e.g., to highlight the value of an object attribute).
- A notation MAY be extended to use any line styles to suit the purpose of the modeler or tool (e.g., to highlight the value of an object attribute) with the condition that the line style MUST NOT conflict with any current BPMN defined line style. Thus, the line styles of Sequence Flow, Message Flow, and Associations MUST NOT be modified.



Poster Info

Author:
Khalid B Simaan
Poster version:
1.0.0 - May 20th 2008

Copyright 2008 ©
Modern Analyst
Media LLC

For more such resources visit
www.ModernAnalyst.com
The premier community for
Business Analysts

