iServer BPMN Stencil: Levels of BPMN
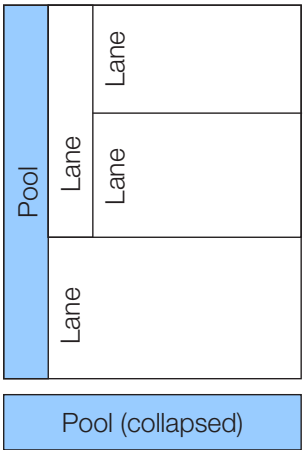
Thanks for Downloading the Free BPMN 2.0 Stencil!

Orbus Software have created a Visio BPMN Stencil that you are free to use. This Stencil was created based on the OMG s BPMN Specification v2.0 (January 2011), and to the best of our knowledge all shapes are fully supported as specified. To download the specification or for further BPMN related information, visit http://www.bpmn.org. This document contains a high level explanation of how to use each type of shape within the stencil, and sample diagrams. Note only 2 levels of BPMN are explained in this guide.

BPMN Level 1:
Descriptive Process Model

Suitable for high level modeling – should be comfortable for analysts that have used flowcharts.

Pools and Lanes

Pool — Lane / Lane / Lane
Pool (collapsed)

Gateways

Exclusive Parallel

Artefacts

Data Object Data Store Group Annotation

Events

Start Events

None Timer Message

End Events

None Message Terminate

Activities

Tasks

Task User Task Service Task

Sub-Processes

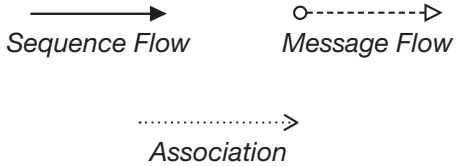Collapsed Sub-Process Expanded Sub-Process Call Activity
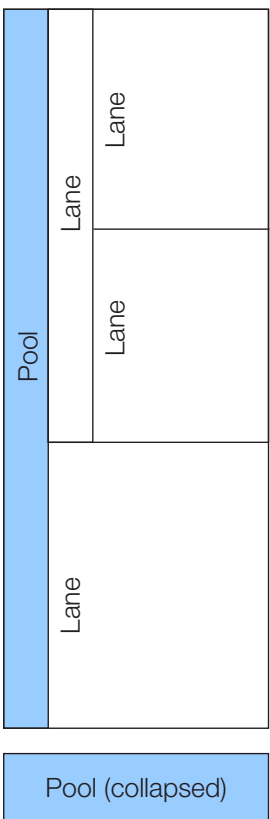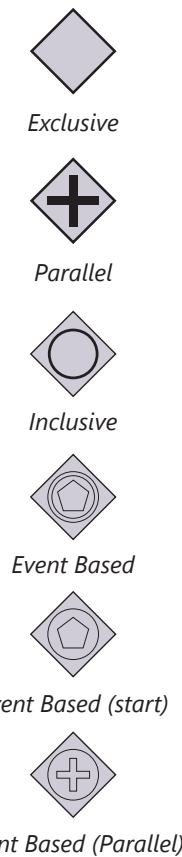
Flow

Sequence Flow Message Flow Association
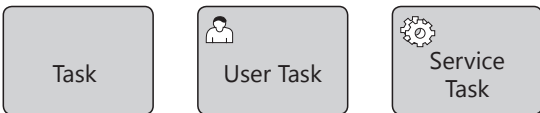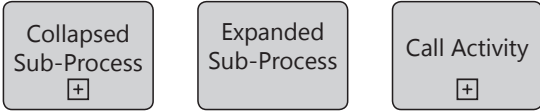
BPMN Level 2:
Analytical Process Model

Contains the concepts most commonly used and covered in BPMN training.

Pools and Lanes

Pool — Lane / Lane / Lane
Pool (collapsed)

Gateways

Exclusive
Parallel
Inclusive
Event Based
Event Based (start)
Event Based (Parallel)

Events

Start Events

None Timer Message Signal Conditional

Intermediate Events

None Message Timer Link
Error Escalation Signal Conditional

End Events

None Message Terminate Signal
Error Escalation

Activities

Tasks

Task User Task Service Task Send Task
Receive Task Loop Multiple Instance

Sub-Processes

Collapsed Sub-Process Expanded Sub-Process Call Activity
Loop Multiple Instance

Flow

Sequence Flow

Normal Conditional Default

Message Flow **Association**

Artefacts

Data Object Data Store Group Annotation
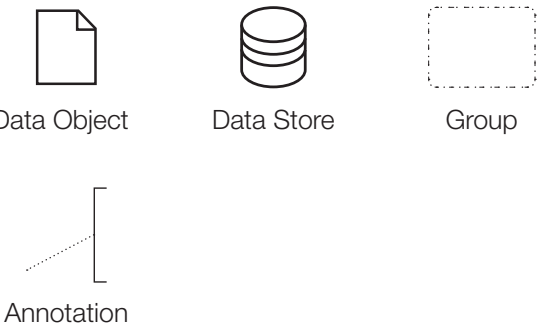
BPMN Level 3: Complete Element Set
Focuses on the elements required for executable process models

Pools and Lanes

A **Pool** is used to define either a group of *Participants* such as an area within an organization or an external entity that collaborates within a process.
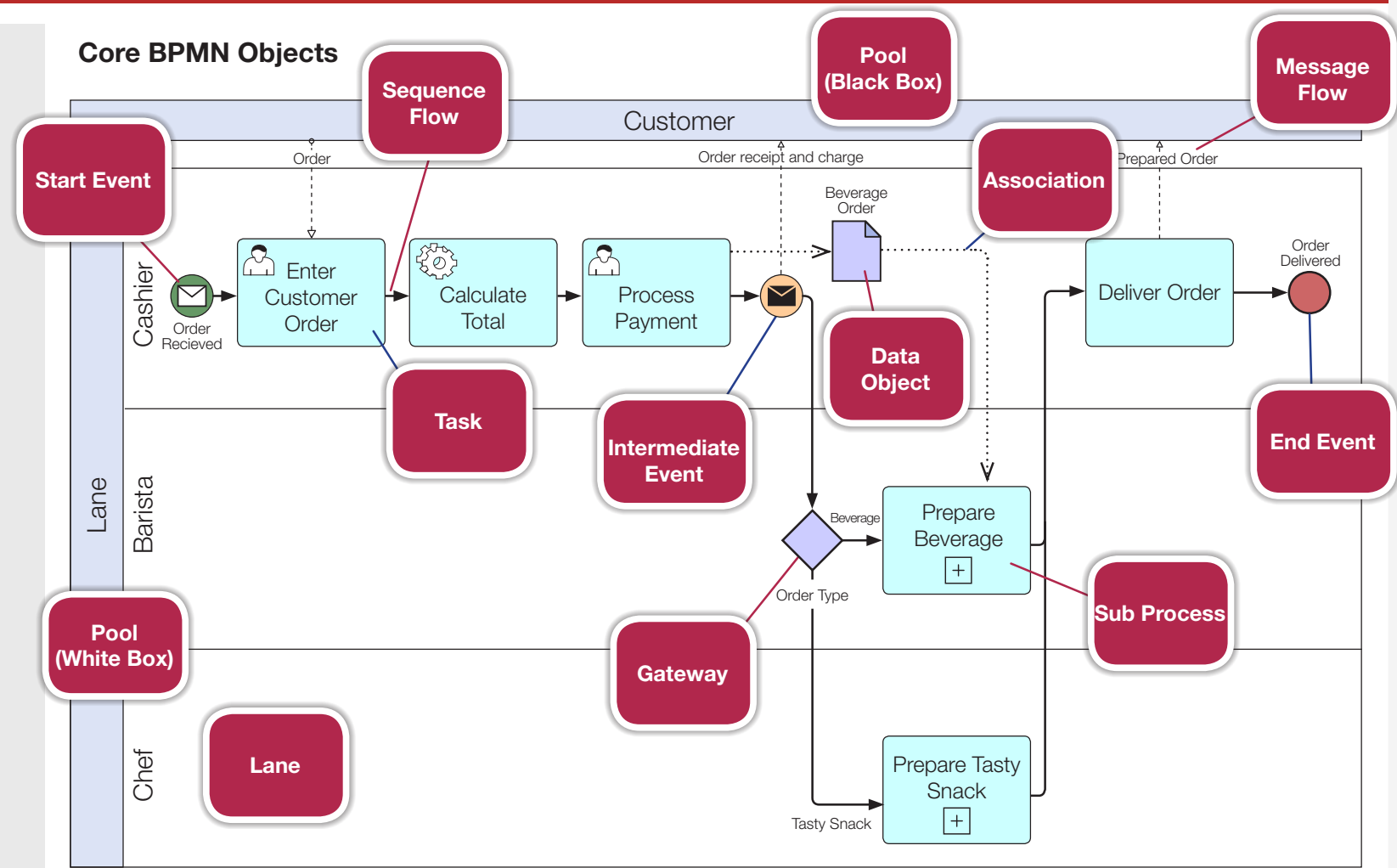
A process model is normally created from the perspective of a single participant – the **White Box Pool**, and contains the detail of that process. **Black Box Pools** are considered external to the scope of the process (although not necessarily outside of the organization), and do not show flow and activities. Black box pools may be collapsed and rotated, but do not have to be.

A **Lane** is used to define a specific participant or role within a process.

A lane may be contained within a pool or may itself be broken down into other lanes:

Core BPMN Objects

- Sequence Flow
- Pool (Black Box)
- Message Flow
- Start Event
- Association
- Task
- Data Object
- Intermediate Event
- End Event
- Pool (White Box)
- Sub Process
- Gateway
- Lane

Customer — Order — Order receipt and charge — Prepared Order

Cashier — Order Recieved → Enter Customer Order → Calculate Total → Process Payment

Beverage Order — Order Delivered — Deliver Order

Barista — Order Type — Beverage — Prepare Beverage [+] — Tasty Snack

Chef — Prepare Tasty Snack [+]

Events

An Event is an indicator that something has happened within a process.

	Top Level	Event Sub Process Interupting	Event Sub Process Non Interupting	Catching	Boundary Interrupting	Boundary Non Interrupting	Throwing	End Event
None	●						●	●
Message	●	●	●	●	●	●	●	●
Timer	●	●	●	●	●	●		
Escalation	●	●		●	●	●	●	●
Conditional	●	●	●	●	●			
Link				●				●
Error		●			●			●
Cancel					●			●
Compensation		●			●		●	●
Signal	●	●	●	●	●	●	●	●
Multiple	●	●	●	●	●	●	●	●
Parallel Multiple	●	●	●	●	●	●		
Terminate								●

A process begins with a **Start Event** indicating something has happened, such as a message received or a date that has been reached.

Intermediate Events happen within the flow of the process (between the start and end events).

A process finishes with an **End Event**. Because a process may have several outcomes, there may be multiple end events.

Gateways

A diverging **Exclusive Gateway** is used to create alternative paths within a Process flow. A converging Exclusive Gateway is used to merge alternative paths.

A diverging **Inclusive Gateway** can be used to create alternative but also parallel paths within a Process flow. A converging Inclusive Gateway is used to merge a combination of alternative and parallel paths.

A **Parallel Gateway** is used to synchronize parallel flows and to create parallel flows.

The **Complex Gateway** can be used to model complex synchronization behavior, not captured by other gateways

The **Event-Based Gateway** represents a branching point in the Process where the alternative paths that follow the Gateway are based on Events that occur, rather than the evaluation of Expressions using Process data (as with an Exclusive or Inclusive Gateway).

Flows

Message Flow is the flow of information as *Messages* between *Participants*.

Sequence Flow is the flow of the process between events that occur, activities performed by the lanes and decisions that are made (gateways).

- Normal
- Default
- Conditional

Associations are used to attach artifacts (such as data objects) to activities.

- Data Association (Directional)
- Data Association (Bi-directional)
- Association

Activities

Within the flow of a process, one or more lanes will perform a number of activities.

A **Task** is something that a lane (role) does during the process. A task is a granular (atomic) activity that cannot or does not need to be broken down any further.

A **Sub Process** summarizes a group of activities, and can be expanded out into further detail. Sub processes can be shown as collapsed (with the [+] symbol), or expanded.

Tasks
- User Task
- Service Task
- Send Task
- Recieve Task
- Manual Task
- Business Rule
- Call Activity (Global Task)
- Loop
- Parallel Multiple Instances
- Sequential Multiple Instances
- Compensation
- Ad Hoc
- Script

Sub Processes
- Collapsed Sub Process
- Expanded Sub Process
- Event Sub Process
- Loop
- Parallel Multiple Instances
- Sequential Multiple Instances
- Compensation
- Ad Hoc
- Transaction
- Event Sub Processes
- Expanded Sub Process

Artifacts

Artifacts allow additional information to be provided on a process model

Data Objects are inputs to and outputs from activities. Data objects could be used to represent documents, data or other objects that are passed between the activities in a process.

- Data Object
- Data Object Collection
- Data Input
- Data Input Collection
- Data Output
- Data Output Collection

A **Data Store** is somewhere that the process can read or write data, that persists beyond the scope of the process.

A **Message** is used to depict the contents of a communication between 2 participants.

A **Group** is a visual way of informally grouping items on a diagram, for example to highlight an area that requires further analysis.

Annotations allow additional information relevant in documenting the process to be shown on the diagram.

iServer BPMN Stencil: Shape Overview

Activities

An Activity represents work that is performed within a Business Process. The types of activities that occur in a Business Process are Task, Sub-Process (Collapsed or Expanded) and Process. A Process is not represented by a shape, but is a group of graphical objects such as Tasks and Sub-Processes. The iServer BPMN Stencil has two Activity shapes: Task and Sub-Process (which can be collapsed or expanded).

Task

A Task is an atomic activity that occurs within a Process. A Task is used when a process cannot be broken down into a finer level of detail. Tasks have a number of different markers.

The Markers available depend on the level of BPMN being used (i.e. Complete Element Set)

Task	Loop	Multiple Instance

User Task	Service Task	Send Task	Receive Task
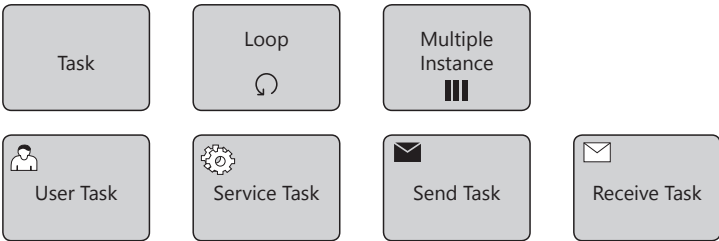
Activities: Collapsed Sub-Process

A Sub-Process is a compound activity that is performed within a Business Process. A collapsed Sub-Process has a plus symbol that indicates that there is a lower level of detail that can be expanded. There are two optional markers: Loop and Multiple Instances. A Sub-Process can also be marked as a Call Activity (with a bold border).

Collapsed Sub-Process	Sub-Process (Call Activity)	Loop	Multiple Instance
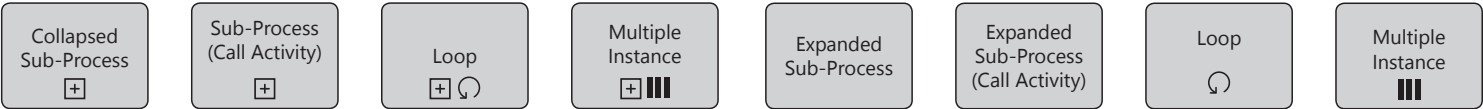
Activities: Expanded Sub-Process

A Sub-Process is a compound activity that is performed within a Business Process. An Expanded Sub-Process contains a Business Process. Note that a Sequence Flow cannot cross the boundary of a Sub-Process. Once again there is a choice of Markers as per the collapsed Sub-Process. Note that a Sub-Process can be changed into an Expanded Sub-Process.

Expanded Sub-Process	Expanded Sub-Process (Call Activity)	Loop	Multiple Instance

Events

An event is something that happens during the course of a business process. These events affect the flow of the process and usually have a trigger or a result, represented as a marker at the centre of the shape. There are three types of Events, based on when they affect the flow: Start, Intermediate, and End. The iServer BPMN Stencil reflects this with three corresponding Event shapes that can be labelled if required. Markers (triggers, results) can be chosen by right clicking on the shape.
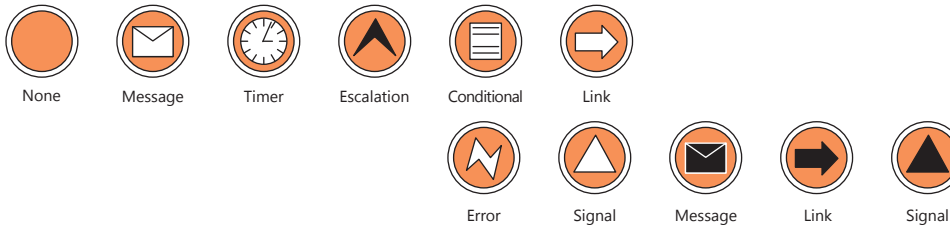
Start Events

A Start Event indicates where a particular Process will start. The Start shape is a circle drawn with a thin border. Start events affect the flow of the process and usually have a trigger. These triggers are graphically represented in the centre of the shape.

None	Timer	Message	Signal	Conditional

Intermediate Events

Intermediate Events occur between a Start Event and an End Event. The Intermediate Event shape is a circle drawn with a double line border. Intermediate Events affect the flow of the process, but do not start or end it. Usually there is a trigger, graphically represented in the centre of the shape. Intermediate Events can be Throwing or Catching, with different Markers available depending on which is selected.

None	Message	Timer	Escalation	Conditional	Link
Error	Signal	Message	Link	Signal	

End Events

An End Event indicates where a process will end. End Events usually have a Result, represented by a marker in the centre of the shape. The End Event shape is a circle drawn with a thick border.

None	Message	Escalation	Error	Signal	Terminate

Gateways

A Start Event indicates where a particular Process will start. The Start shape is a circle drawn with a thin border. Start events affect the flow of the process and usually have a trigger. These triggers are graphically represented in the centre of the shape.

Exclusive	Exclusive with Marker	Parallel	Event Based	Event Based (start)	Event Based (Parallel)
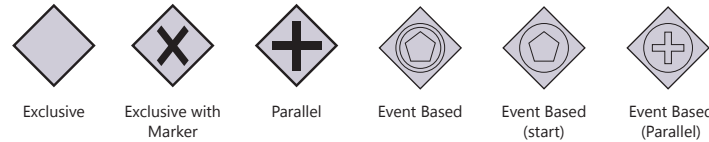
Group

A group is a visual way of informally grouping elements within a Business Process. It must be drawn with a solid dashed black line.

Data Store

A data store is somewhere that the process can read or write data, that persists beyond the scope of the process.

Artifacts

Artifacts show additional information about a process without being directly related to the Sequence/Message flow. The Artifact shapes provided in the iServer BPMN Stencil are: Data Object, Data Store, Annotation and Group.
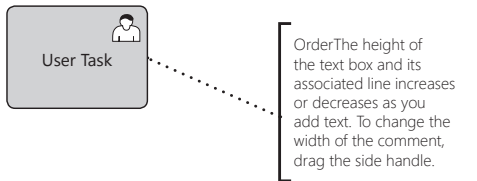
Data Object

A Data Object provides information about what a process does. The name suggests an electronic document, but can represent many different types of electronic and physical objects. Data Objects are generally associated with Flow Objects (using an Association to connect them), as shown below:

Send Purchase Order → Purchase Order → Make Payments
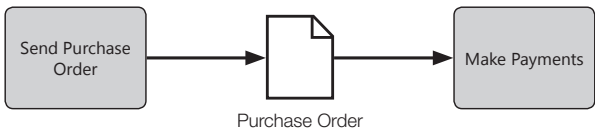
Annotation

An annotation allows the modeller to provide additional information for the reader. Annotations can be associated with any object on a Business Process Diagram.

User Task

OrderThe height of the text box and its associated line increases or decreases as you add text. To change the width of the comment, drag the side handle.

Pools

A Pool represents a Participant in a Process. Examples of Participants are Entities such as Companies, or Roles such as Customer, Vendor, Manufacturer. A Pool separates (partitions) one process from other pools.Pools, and the items within them, may be connected by Message Flows. Pools can be collapsed or expanded as shown below.
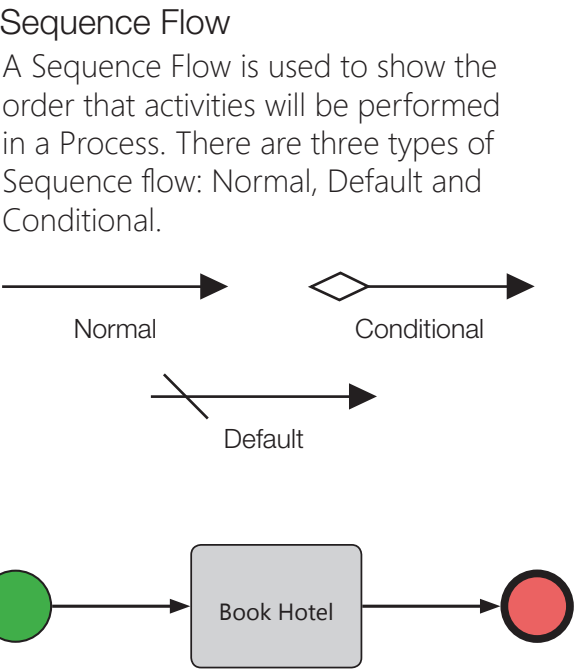
Manufacturer

Request   Request

Vendor
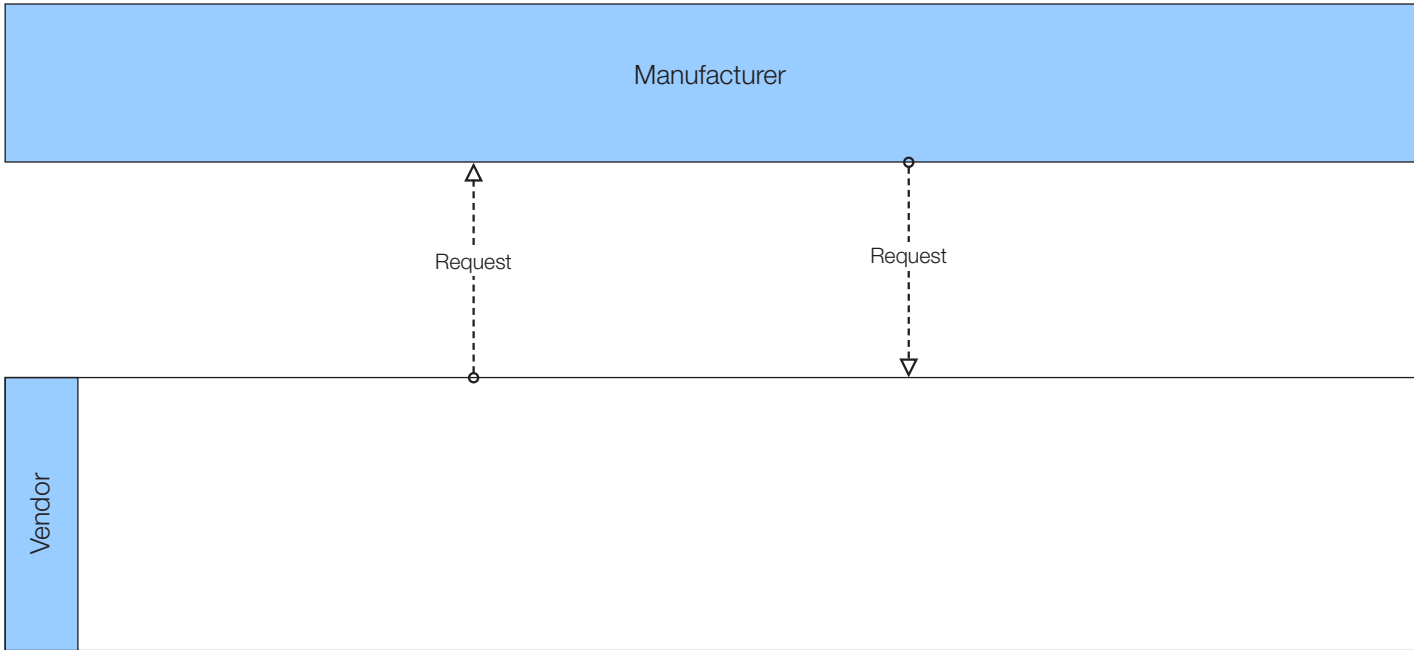
Lanes

Lanes are optional sub-partitions of pools, and are used to organize activities within a pool. The Lane shape can be indented to represent sub-lanes – to increase the indent of a lane, right click the lane and select indent . The indent can also be decreased.

Pool

Lane

Lane

Lane

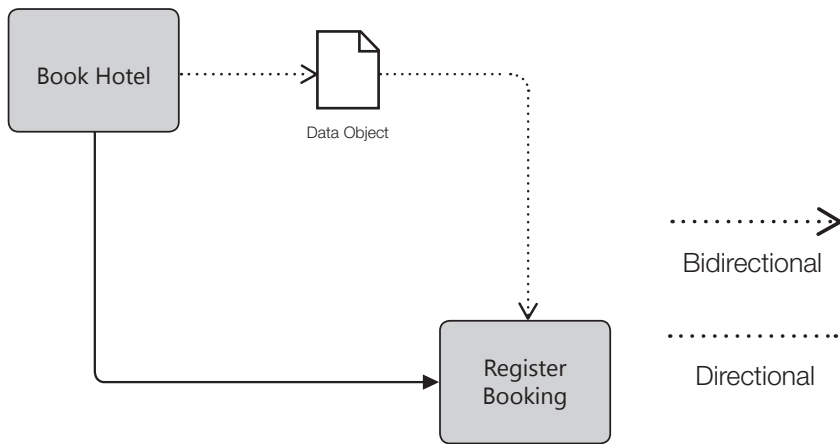Lane

Connecting Objects and Flow

There are two ways of connecting BPMN Objects: A Flow (either Sequence Flow or Message Flow), or an Association. Sequence flows are used to show the order in which activities are performed within a Business Process, whereas Message Flows are used to show the flow of messages between two pools on the diagram. Typically Message Flows will flow at 90 degrees to the direction of the Sequence flows. Associations are used to associate Artifacts with Flow Objects.
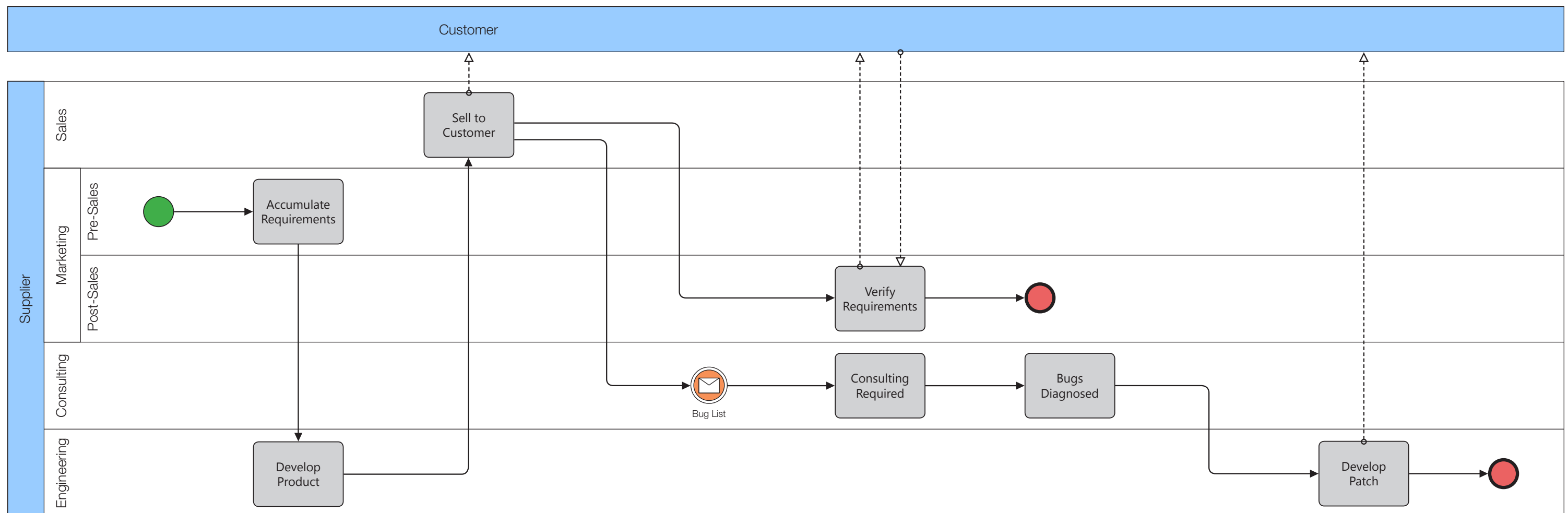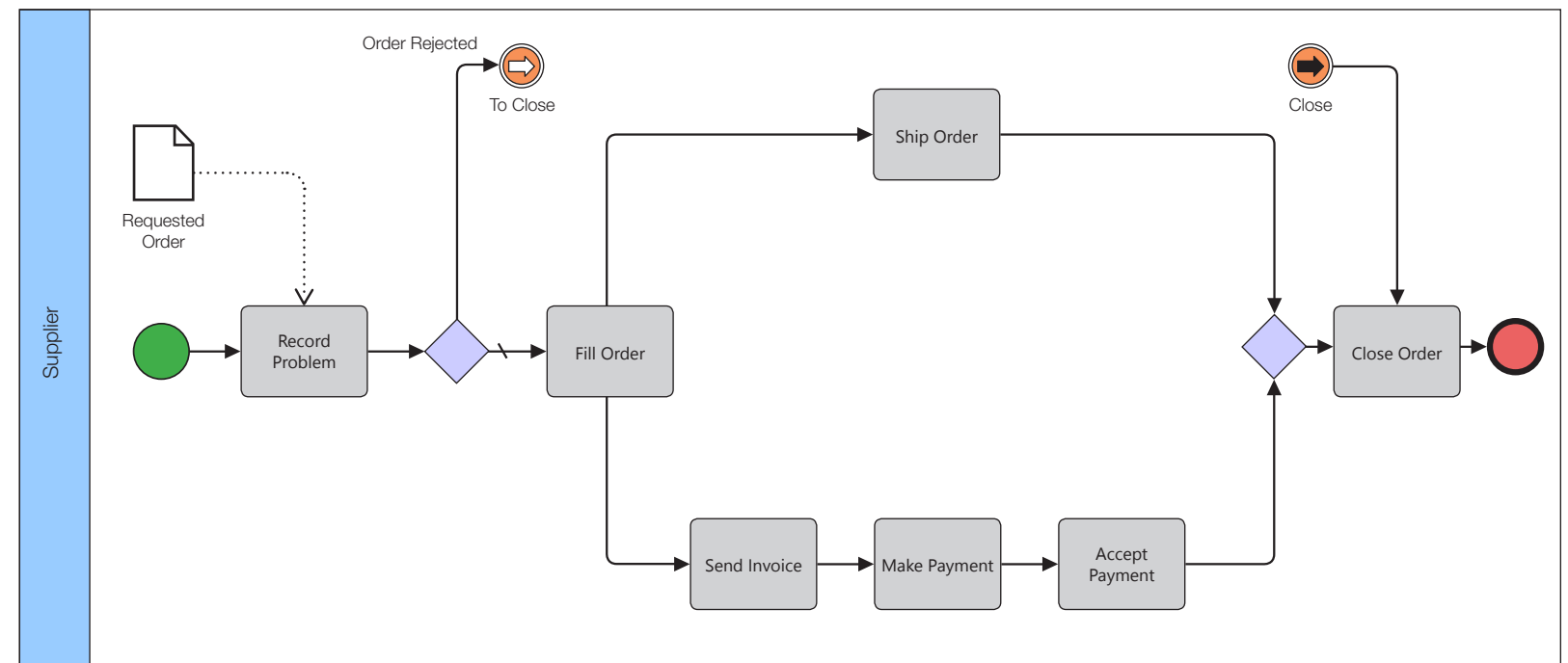
Sequence Flow

A Sequence Flow is used to show the order that activities will be performed in a Process. There are three types of Sequence flow: Normal, Default and Conditional.

Normal   Conditional

Default

Book Hotel

Message Flow

A Message Flow is used to show the flow of messages between two participants that are prepared to send and receive them. In BPMN, two separate Pools in the Diagram will represent the two participants (e.g., business entities or business roles). The Message Flow may connect the pools themselves, or items within them.A Message represents the content of a communication between two Participants. In BPMN 2.0, a Message is a graphical decorator.

Message Flow   Message
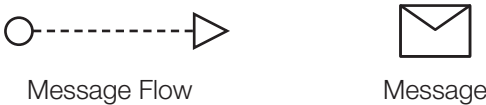
Association

An Association is used to associate information (Artifacts such as data objects or annotations) with Flow Objects. Text and graphical non-Flow Objects can be associated with the Flow Objects.

Book Hotel

Data Object

Register Booking

Bidirectional

Directional

iServer BPMN Stencil: Process Order and Product Development

Customer — Credit Card Authorization

Supplier
- Distribution: Pack Goods → Ship Goods
- Sales: Authorize Payment → Purchase Order

Supplier
- Requested Order → Record Problem → Fill Order → Ship Order → Close Order
- Order Rejected → To Close
- Send Invoice → Make Payment → Accept Payment
- Close

Customer

Supplier
- Sales: Sell to Customer
- Marketing
  - Pre-Sales: Accumulate Requirements
  - Post-Sales: Verify Requirements
- Consulting: Bug List → Consulting Required → Bugs Diagnosed
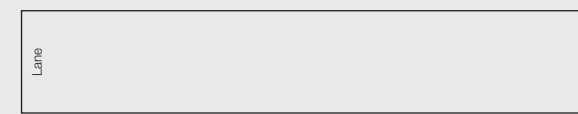- Engineering: Develop Product, Develop Patch

BPMN 2.0 Business Process Model And Notation - Complete Element Set
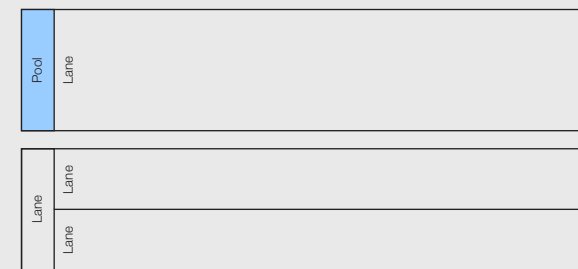
Pools and Lanes

A **Pool** is used to define either a group of *Participants* such as an area within an organization or an external entity that collaborates within a process.

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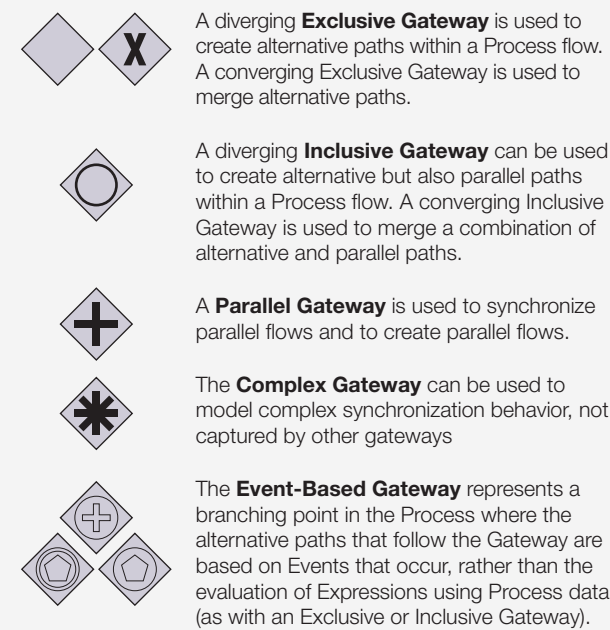
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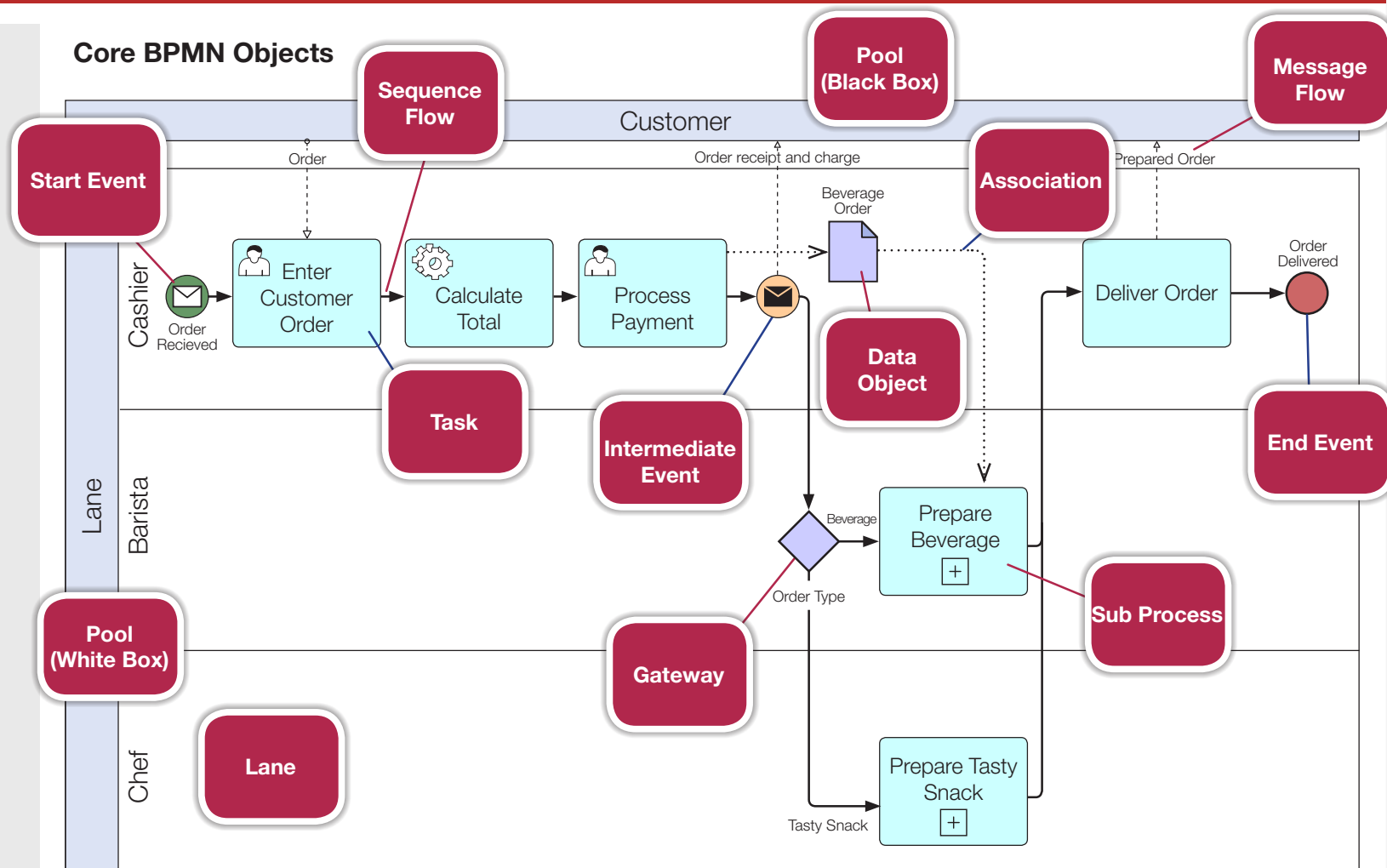
A lane may be contained within a pool or may itself be broken down into other lanes:

Core BPMN Objects

- Sequence Flow
- Pool (Black Box)
- Message Flow
- Start Event
- Association
- Task
- Data Object
- Intermediate Event
- End Event
- Sub Process
- Pool (White Box)
- Gateway
- Lane

Customer

Cashier — Order Recieved — Enter Customer Order — Calculate Total — Process Payment — Beverage Order

Barista — Order Type — Prepare Beverage

Chef — Prepare Tasty Snack — Tasty Snack

Order — Order receipt and charge — Prepared Order — Order Delivered — Deliver Order

Beverage

Events

An Event is an indicator that something has happened within a process.

	Top Level	Event Sub Process Interrupting	Event Sub Process Non Interrupting	Catching	Boundary Interrupting	Boundary Non Interrupting	Throwing	End Event
None	●						●	●
Message	✉	✉	✉	✉	✉	✉	✉	✉
Timer	⏰	⏰	⏰	⏰	⏰	⏰		
Escalation	⌃	⌃		⌃	⌃	⌃	⌃	⌃
Conditional	▤	▤	▤	▤	▤			
Link				➡			➡	
Error		↯			↯			↯
Cancel					✕			✕
Compensation		◀◀		◀◀		◀◀	◀◀	◀◀
Signal	▲	▲	▲	▲	▲	▲	▲	▲
Multiple	⬠	⬠	⬠	⬠	⬠	⬠	⬠	⬠
Parallel Multiple	✚	✚	✚	✚	✚	✚		
Terminate								◉

A process begins with a **Start Event** indicating something has happened, such as a message received or a date that has been reached.

Intermediate Events happen within the flow of the process (between the start and end events).

A process finishes with an **End Event**. Because a process may have several outcomes, there may be multiple end events.

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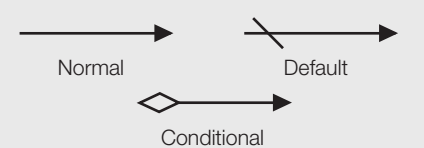
Flows

Message Flow is the flow of information as *Messages* between *Participants*.

Sequence Flow is the flow of the process between events that occur, activities performed by the lanes and decisions that are made (gateways).

- Normal
- Default
- Conditional

Associations are used to attach artifacts (such as data objects) to activities.

- Data Association (Directional)
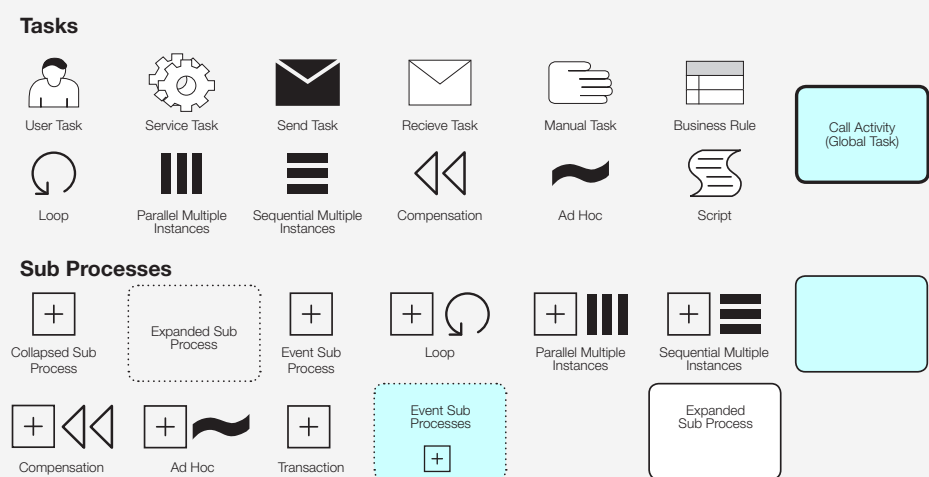- Data Association (Bi-directional)
- Association

Activities

Within the flow of a process, one or more lanes will perform a number of activities.

A **Task** is something that a lane (role) does during the process. A task is a granular (atomic) activity that cannot or does not need to be broken down any further.

A **Sub Process** summarizes a group of activities, and can be expanded out into further detail. Sub processes can be shown as collapsed (with the [+] symbol), or expanded.

Tasks

- User Task
- Service Task
- Send Task
- Recieve Task
- Manual Task
- Business Rule
- Loop
- Parallel Multiple Instances
- Sequential Multiple Instances
- Compensation
- Ad Hoc
- Script
- Call Activity (Global Task)

Sub Processes

- Collapsed Sub Process
- Expanded Sub Process
- Event Sub Process
- Loop
- Parallel Multiple Instances
- Sequential Multiple Instances
- Compensation
- Ad Hoc
- Transaction
- Event Sub Processes
- Expanded Sub Process

Artifacts

Artifacts allow additional information to be provided on a process model

Data Objects are inputs to and outputs from activities. Data objects could be used to represent documents, data or other objects that are passed between the activities in a process.

- Data Object
- Data Object Collection
- Data Input
- Data Input Collection
- Data Output
- Data Output Collection

A **Data Store** is somewhere that the process can read or write data, that persists beyond the scope of the process.

A **Message** is used to depict the contents of a communication between 2 participants.

A **Group** is a visual way of informally grouping items on a diagram, for example to highlight an area that requires further analysis.

Annotations allow additional information relevant in documenting the process to be shown on the diagram.