BUSINESS PROCESS MODEL AND NOTATION (BPMN)

BPMN INTRODUCTION

- BPMN 2.0 is an international standard for business process modeling.
- Developed by Business Process Management Initiative (BPMI), and is currently maintained by the Object Management Group since the two organizations merged in 2005
- Supports business process management for technical and business users
- Bridge communication gap between business process design and implementation

BPMN INTRODUCTION

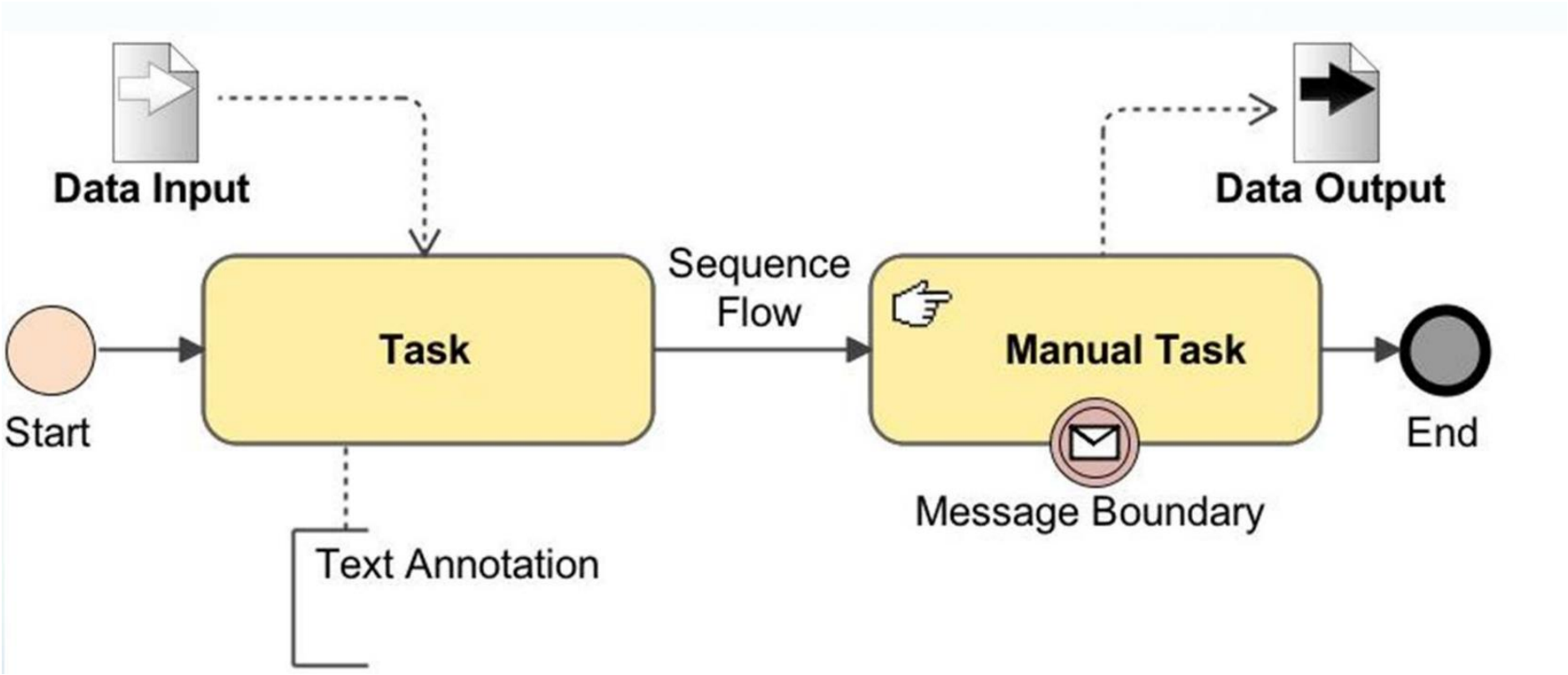
- The BPMN specification describes:
  - how the elements of a process diagram have to look like (**notation**),
  - how these can be combined with each other (**meta model / syntax**),
  - what a diagram means (**semantics**) and
  - how diagrams can be transferred from one tool to another (**XML interchange format**).
- Process models describe sequences of business activities from start to finish, e.g. Order-to-Cash.

PROS AND CONS

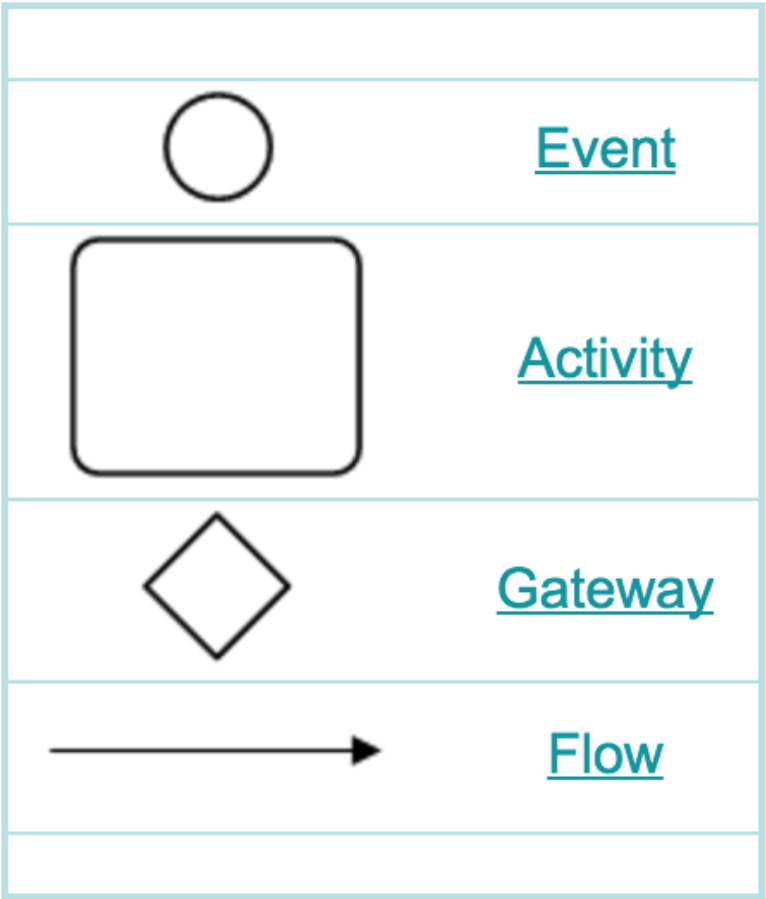
- **Pros**
  - Standard notation
  - Model concepts and/or implementation of business process
  - Models high-level process concepts
  - Notation is not complex

- **Cons**
  - Limited complexity
  - Process/conversation oriented
  - Very high level
  - Cannot see details of tasks or data

SIMPLE BPMN PROCESS DIAGRAM

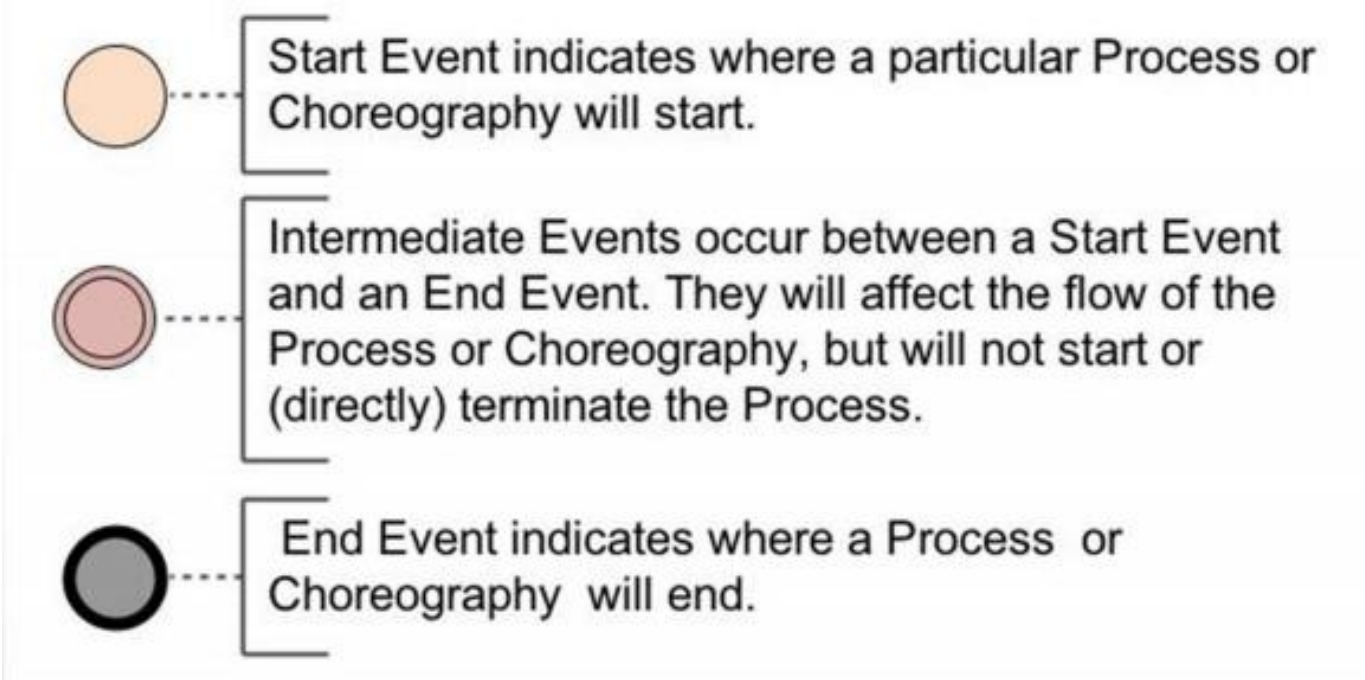


BPMN BASICS

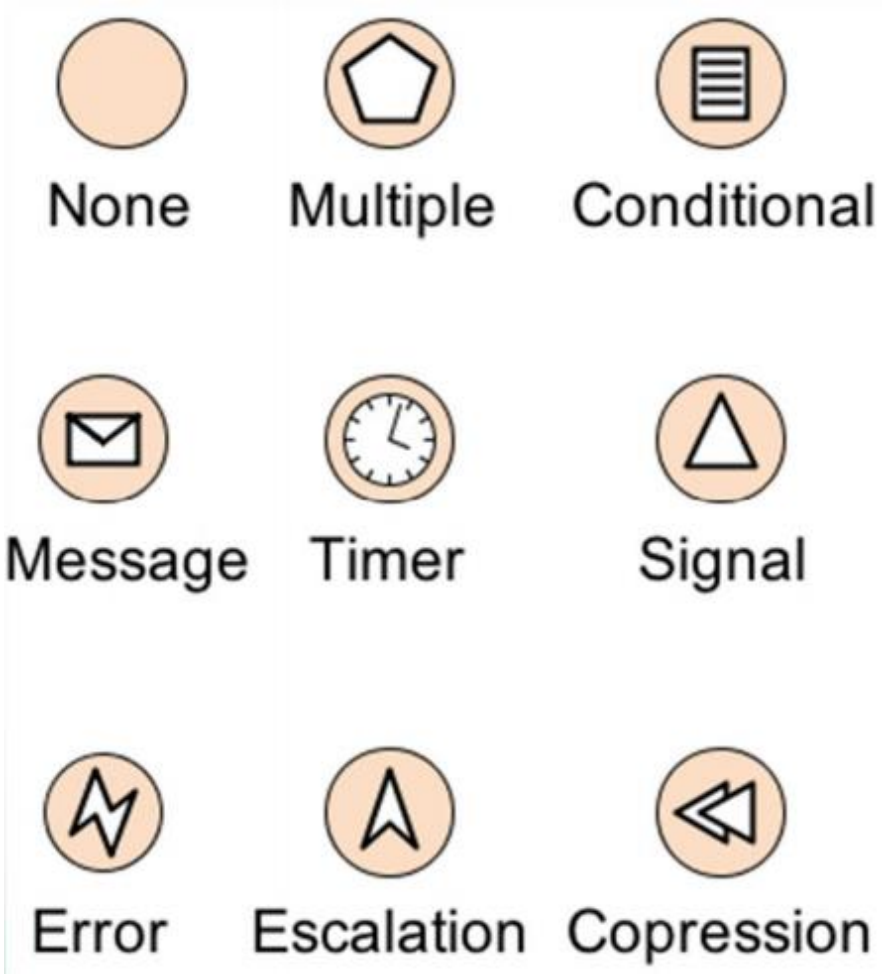


EVENTS

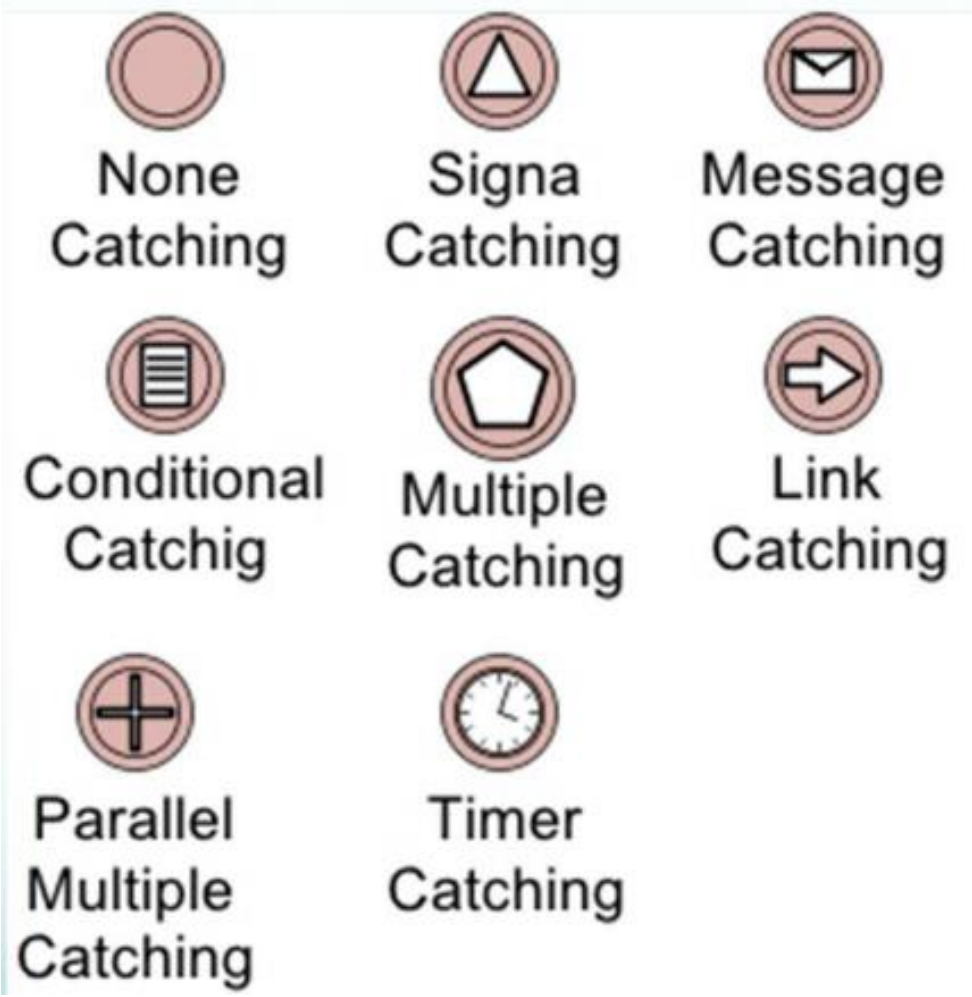
- An event is something that "happens" during the course of a process or a choreography. They affect the flow of the model and usually have a cause (Trigger) or an impact (Result). There are three types of Events, based on when they affect the flow:



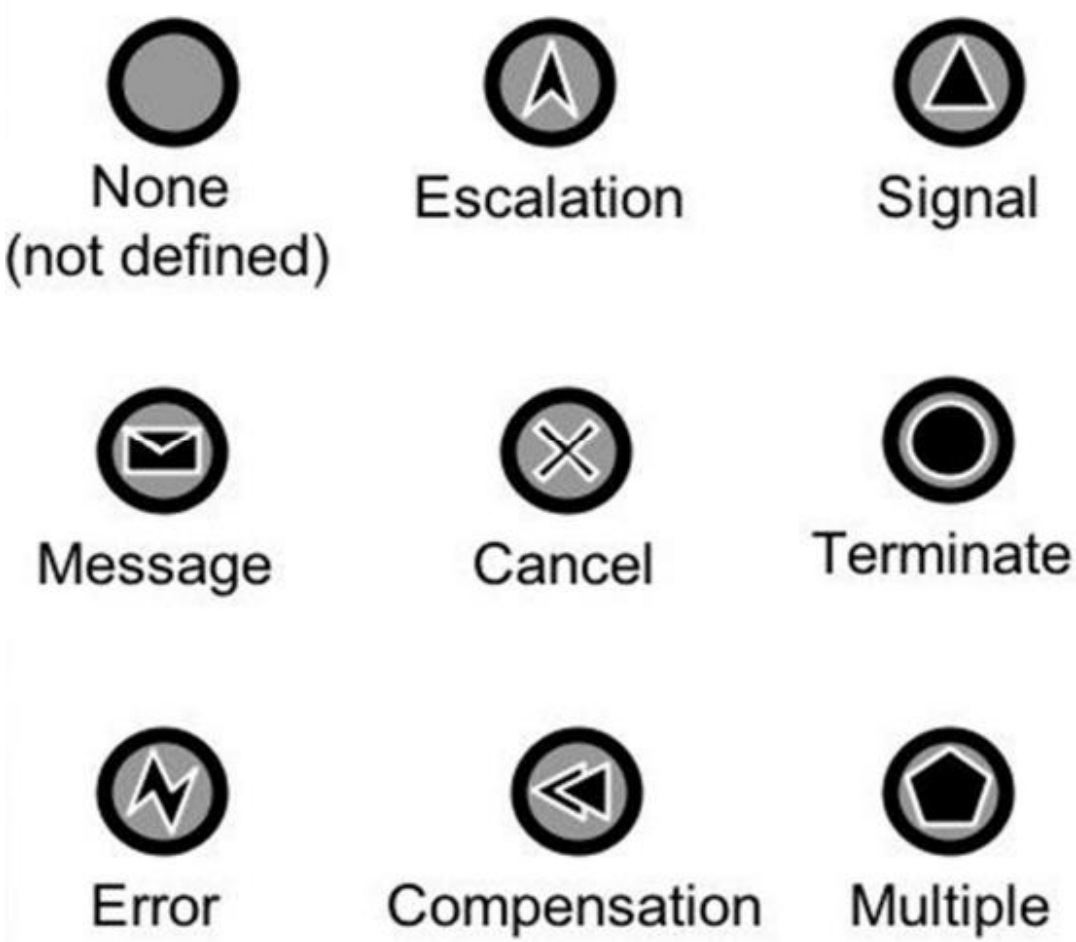
START EVENTS



INTERMEDIATE EVENTS



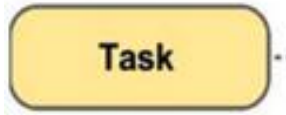
END EVENTS


None
(not defined)
Escalation
Signal
Message
Cancel
Terminate
Error
Compensation
Multiple

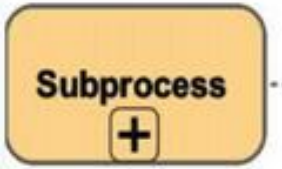
ACTIVITIES

- Work that is performed within a Business Process.
- Activity can be atomic or non-atomic (compound)
- High-level, so does not describe the activity detail (not the job of BPMN)
- Three types: Task, Sub-process, and Transaction

ACTIVITY SYMBOLS



Single unit of work that is not or cannot be broken down to a further level of business process detail without diagramming the steps in a procedure (not the purpose of BPMN)



Hide or reveal additional levels of business process detail - wher collapsed a sub-process is indicated by a plus sign against the bottom line of the rectangle; when expanded the rounded rectangle expands to show all flow objects, connecting objects, and artifacts.

Has its own self-contained start and end events, and sequence flows from the parent process must not cross the boundary.

A form of sub-process in which all contained activities must be treated as a whole, i.e., they must all be completed to meet an objective, and if any one of them fails they must all be compensated (undone). Transactions are differentiated from expanded sub-processes by being surrounded by a tramline border.

GATEWAYS

- Gateways are used to control how Sequence Flows interact as they converge and diverge within a Process.
- Capable of consuming or generating additional tokens.
- Define decisions/branching (exclusive, inclusive, and complex), merging, forking, and joining.

GATEWAY SYMBOLS

Exclusive

A diverging Exclusive Gateway (Decision) is used to create alternative paths within a Process flow. This is basically the "diversion point in the road" for a Process. For a given instance of the Process, only one of the paths can be taken.

Inclusive

Inclusive Gateway (Inclusive Decision) can be used to create alternative but also parallel paths within a Process flow. The true evaluation of one condition Expression does not exclude the evaluation of other condition Expressions. All Sequence Flows with a true evaluation will be traversed by a token.

Complex

The Complex Gateway can be used to model complex synchronization behavior. An Expression activationCondition is used to describe the precise behavior.

Event Based

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). A specific Event, usually the receipt of a Message, determines the path that will be taken.

Parallel

A Parallel Gateway is used to synchronize (combine) parallel flows and to create parallel flows.

FLOW

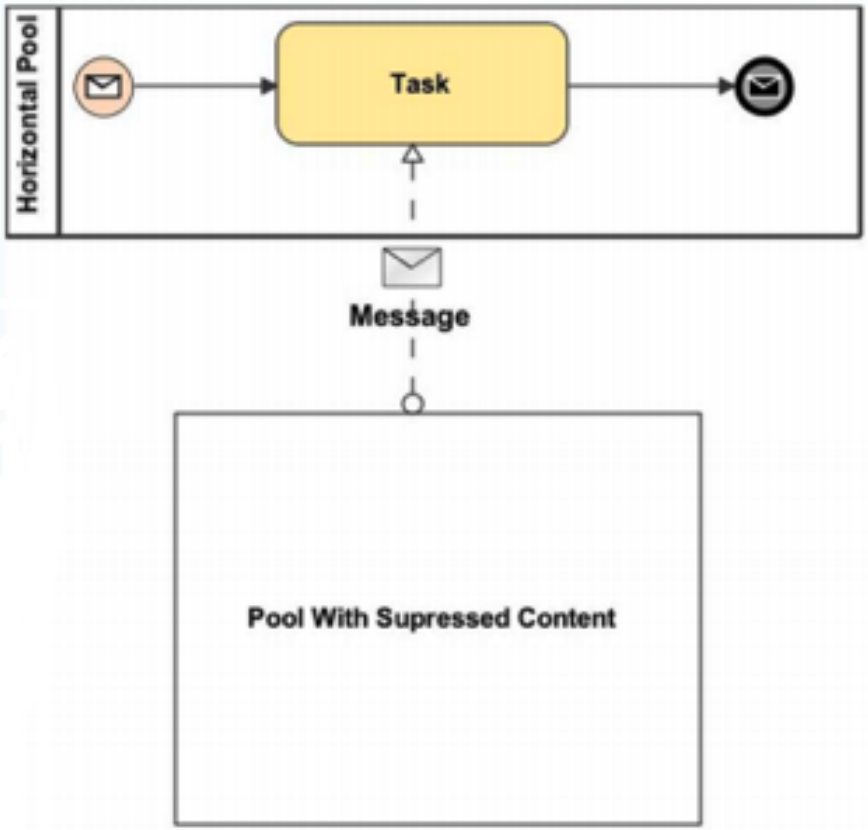
Sequence Flow		Sequence flow defines the execution order of activities.
Association (undirected)		Attaching a data object with an undirected association to a sequence flow indicates hand-over of information between the activities involved.
Association (unidirectional)		A directed association indicates information flow. A data object can be read at the start of an activity or written upon completion.
Association (bidirectional)		A bidirected association indicates that the data object is modified, i.e. both read and written during the execution of an actvity.
Message Flow		Message flow symbolizes information flow across organizational boundaries. Message flow can be attached to pools, activities or message events. The order of message exchanges can be specified by combining message flow and sequence flow.

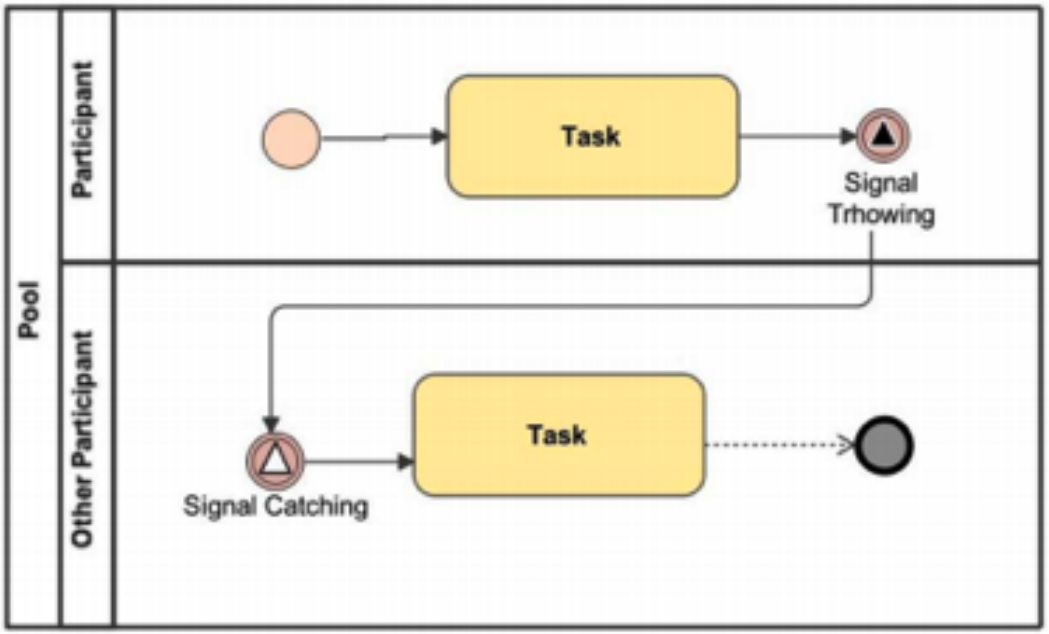
POOLS AND LANES

- A Pool is the graphical representation of a Participant in a Collaboration.
- It also acts as a “swimlane” and a graphical container for partitioning a set of Activities from other Pools
- Pool MAY have internal details, in the form of the Process that will be executed
- Pool MAY have no internal details, i.e., it can be a "black box."

- Lane (Swimlane) is a sub-partition within a Process
- Extend the entire length of the Process
- Lanes are used to organize and categorize Activities

POOLS AND LANES

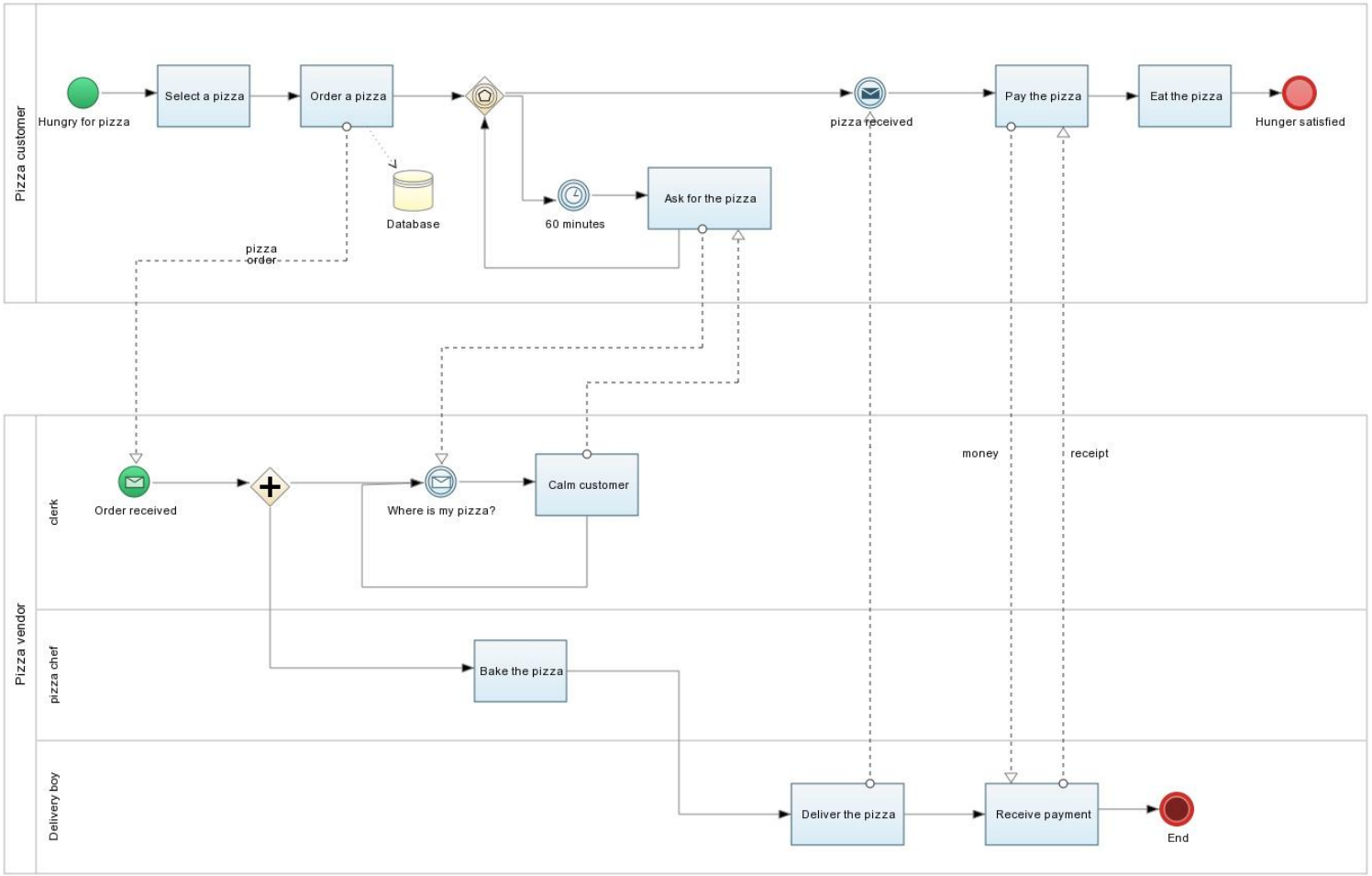




BPMN BASIC RULES

- Sequence Flow
  - ✓ They are used to show the order of Activities
  - ✗ They cannot cross Sub-Process boundaries
  - ✗ They cannot cross Pool boundaries
- Message Flows
  - ✓ They are used to show communication between Participants
  - ✗ They cannot connect objects that are within the same Pool
- Boundary Events
  - ✓ Must have at most one outgoing Sequence Flow
  - ✗ Must not have any incoming Sequence Flow
- Start Events
  - ✓ A Start Event in a Sub-Process must be of type None

BPMN EXAMPLE – PIZZA COLLABORATION



- BPMN 2.0, A simple introduction
  - https://www.youtube.com/watch?v=Uk6WaW9QWn8
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- Simple BPMN 2.0 Diagram Adonis
  - https://www.youtube.com/watch?v=9YppLVcYw2s