

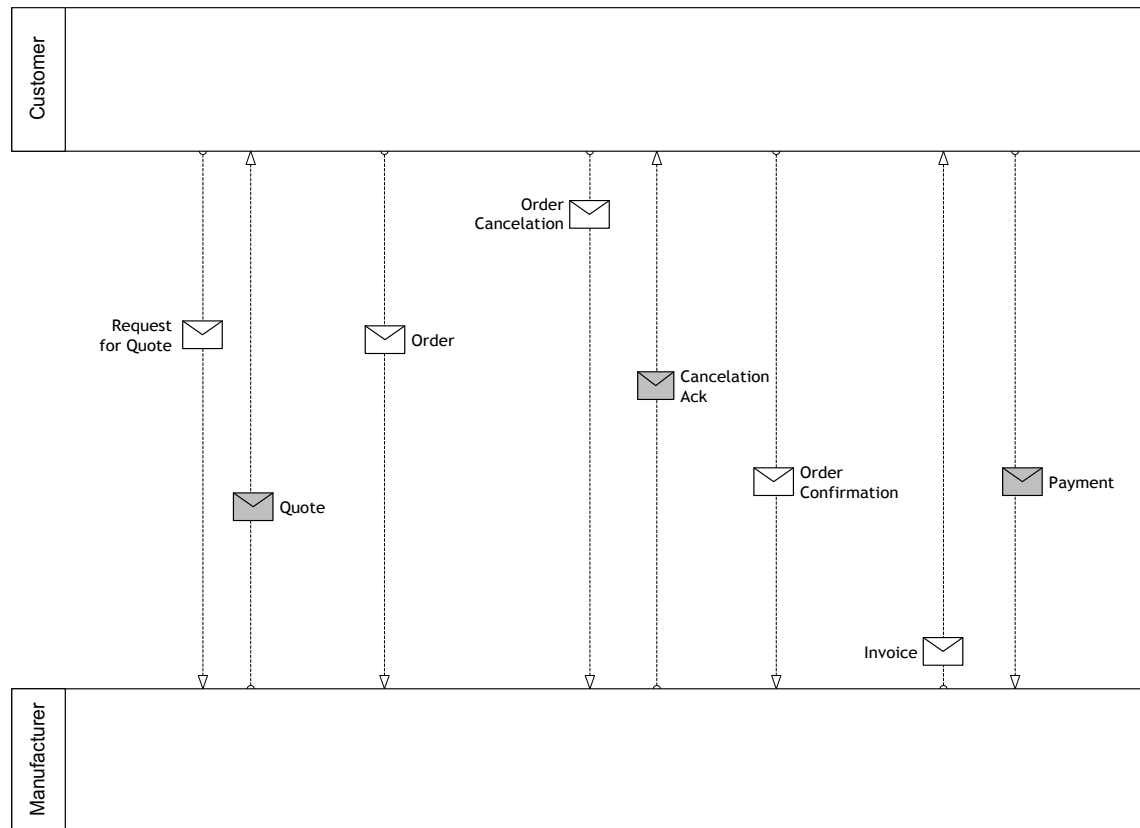


BPMN Choreography Diagram

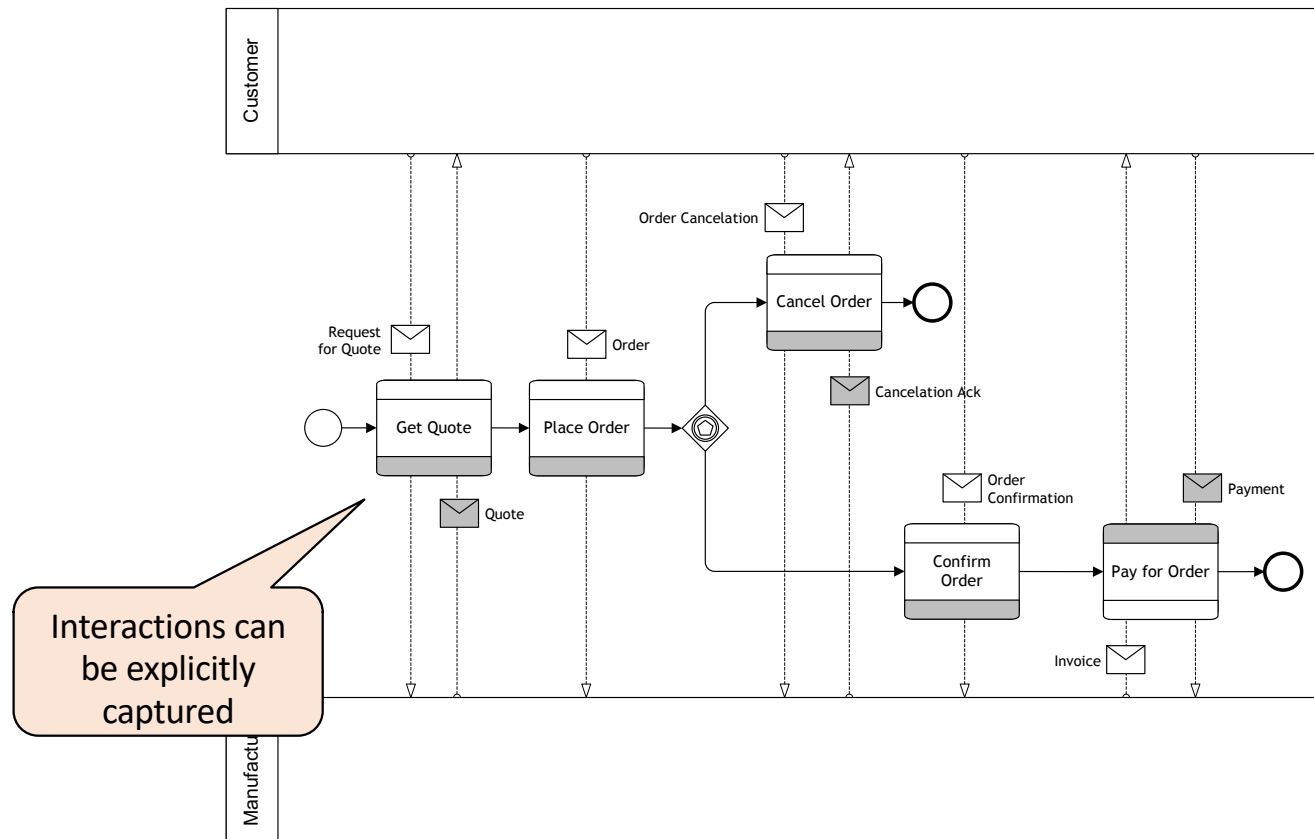
Barbara Re

Choreography Diagram

Focuses on the **interactions** among two or more participants.

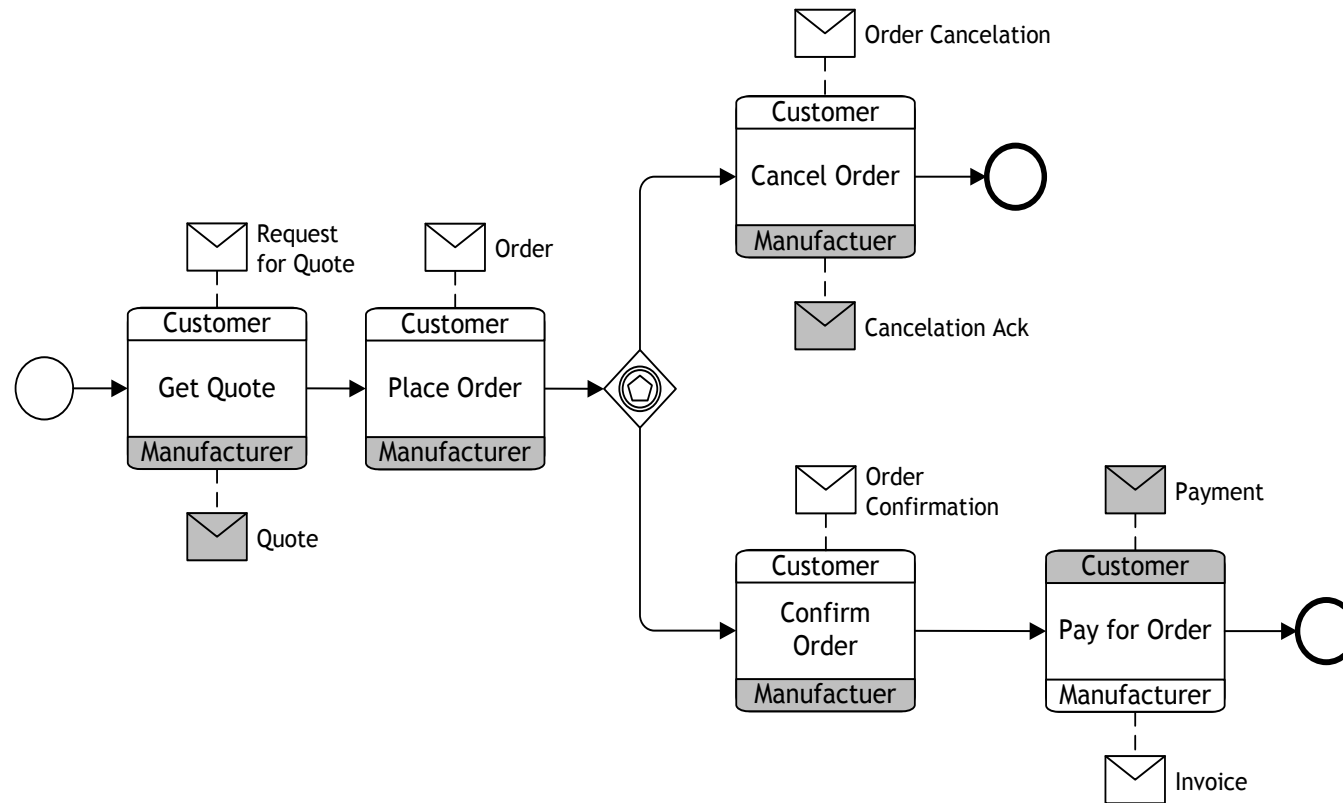


Choreography Diagram (cont'ed)



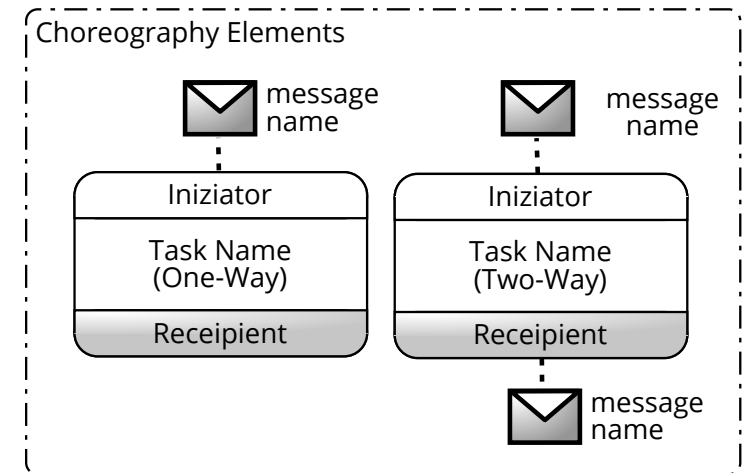
Interactions can be explicitly captured

Choreography Diagram (cont'ed)



Choreography Task

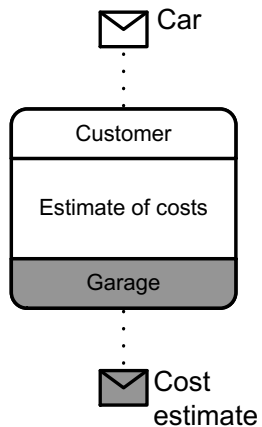
- ▶ Atomic activity
- ▶ Represents an interaction between two business parties
- ▶ Either one-way (asynchronous) or two-way (synchronous)
- ▶ Distinction between initiating and receiving party



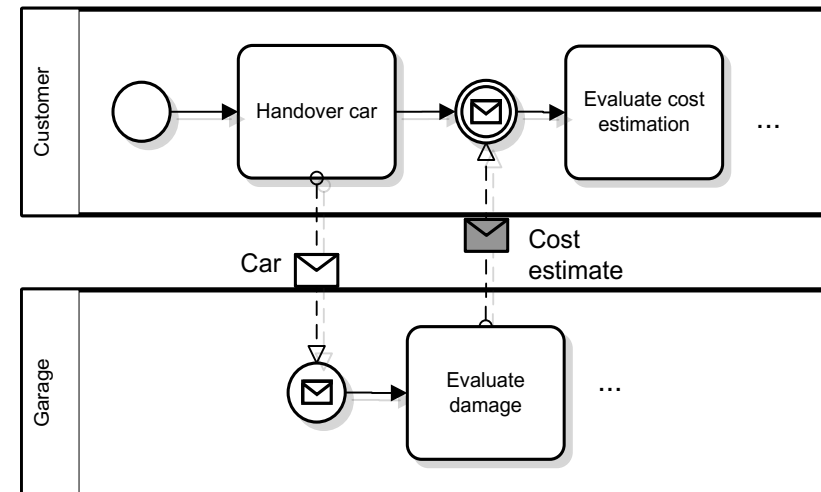
Choreography Task

- ▶ Band of initiating party unfilled
- ▶ Message icons optional

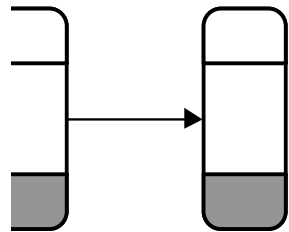
Choreography Task



Collaboration View



Basic Choreography Elements



Sequence flow – Connects and orders choreography tasks, events and gateways



Events – Most process events allowed. No non-interrupting events



Parallel Gateway

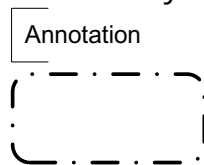


Exclusive Gateway



Event Based Gateway

Gateways – All process gateways allowed: Exclusive, Inclusive, Parallel and Event-based gateways

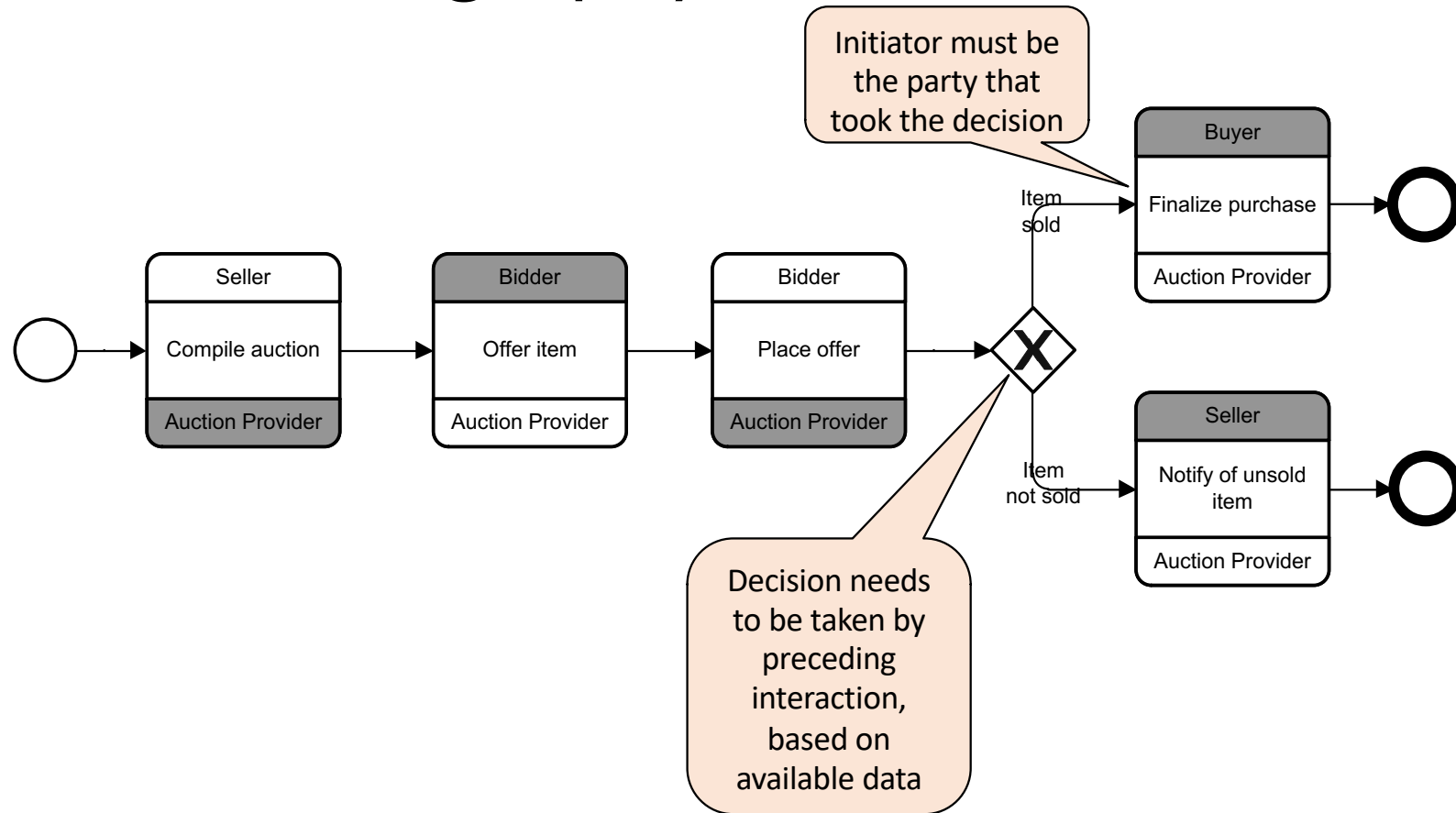


Text annotations, groups – No restrictions on their use

Example: Choreography of an auction

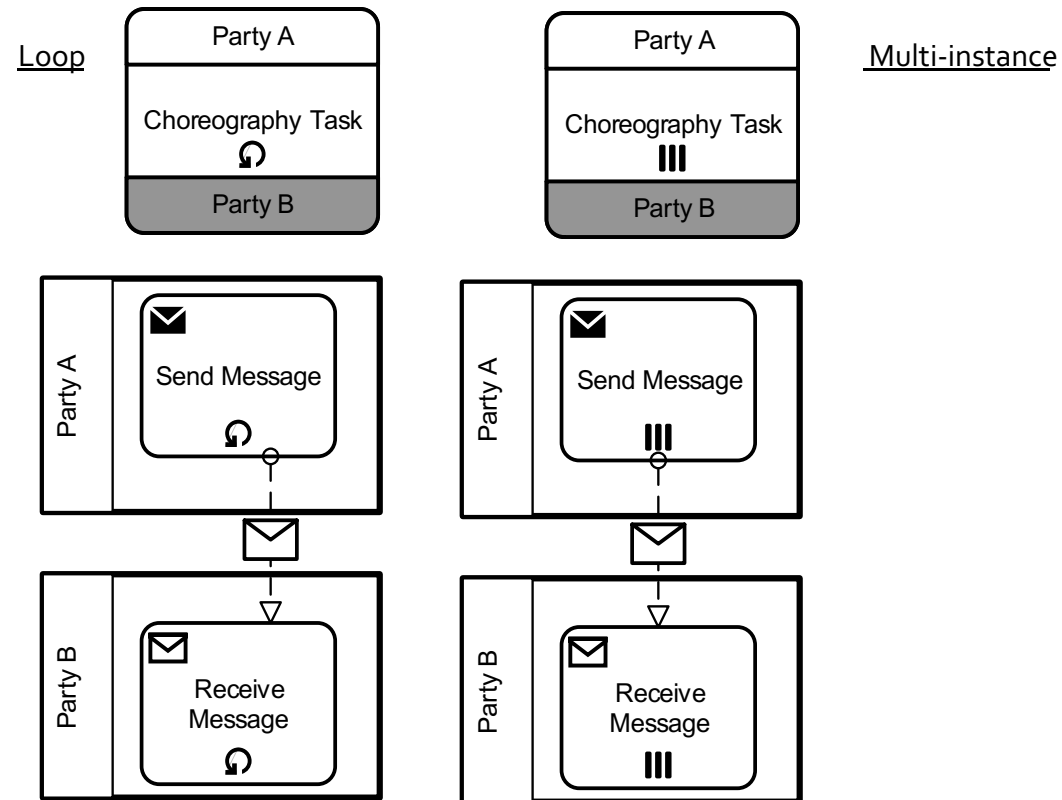
A Seller sends information about an item he wants to sell to an auction Provider. The Provider publishes the auction by offering the item to the Bidder. Once the auction has started the Bidder places an offer. In case the item is sold the auction Provider finalises the purchase with the Buyer, otherwise he notifies the Seller that his item has not been sold.

Solution: Choreography of an auction



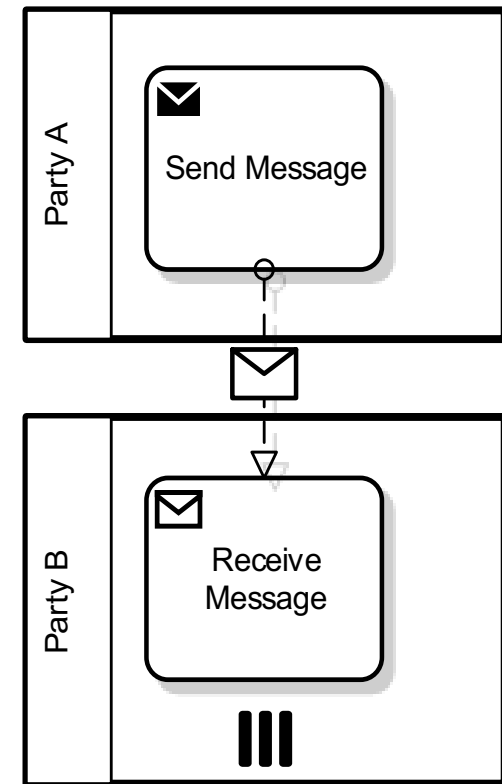
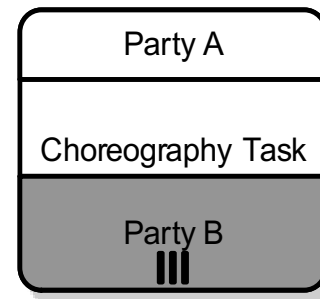
Choreography Task – Internal Markers

Only one of the loop or multi-instance applicable



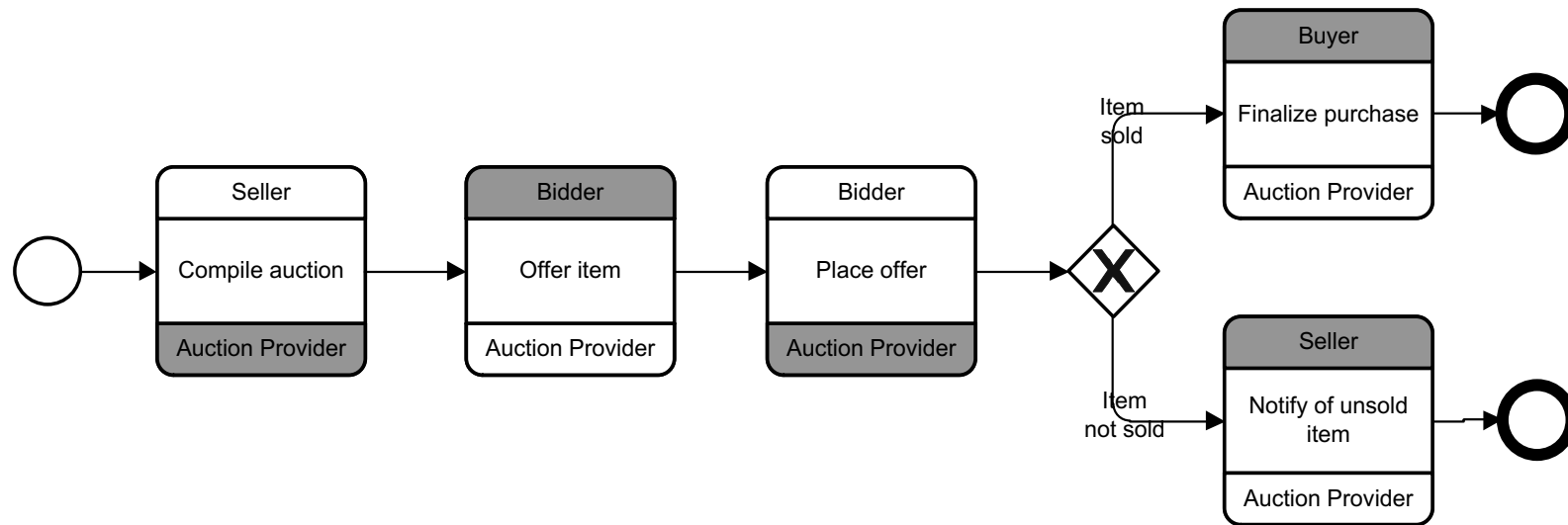
Choreography Task

Multi-instance Party marker



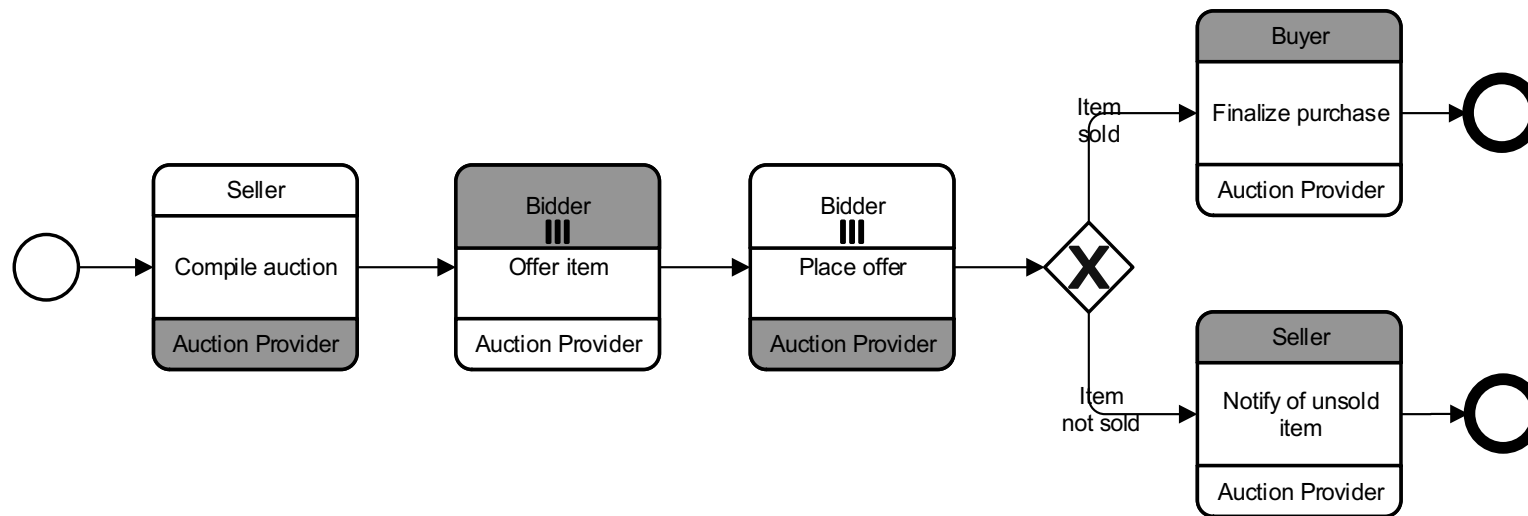
Example: Choreography of an auction

Where can we use the MI party in the auction example?



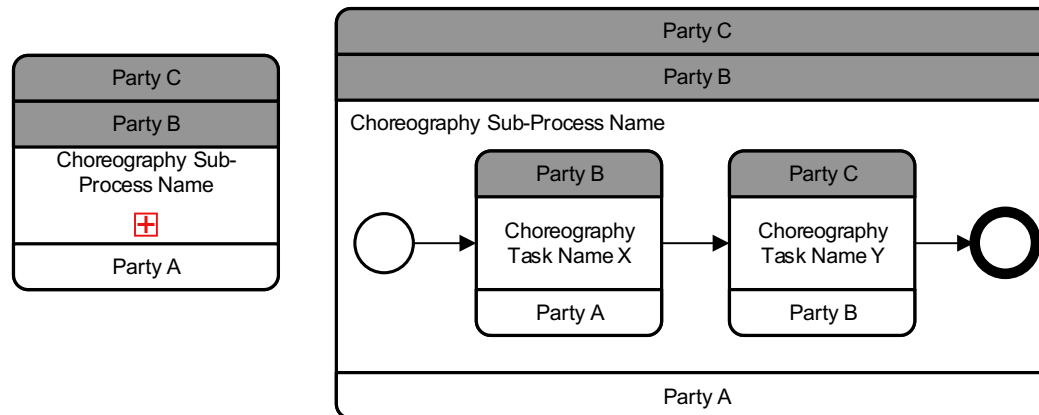
Example: Choreography of an auction

Where can we use the MI party in the auction example?



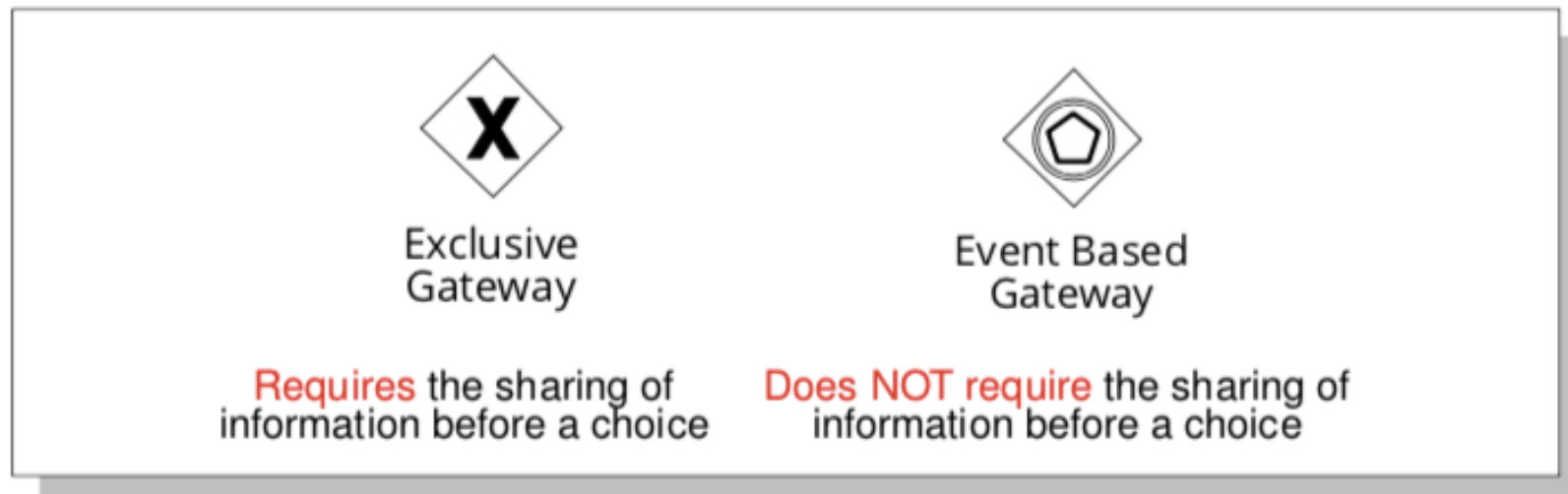
Sub-Choreography

- Compound activity of a choreography
- Involves at least two business parties
- Loop, MI activity and MI party markers are applicable



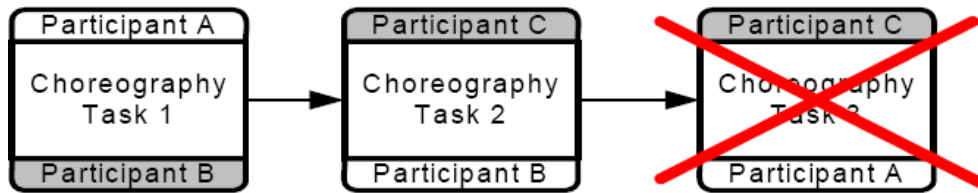
Choreography Related Characteristics

- **Realizability** - a choreography is realisable if the initiator of a choreography activity must have been involved as initiator or receiver in the previous choreography activity
- **Data Management** - data in choreography does not have any control mechanism, so they are not maintained in any central source; the only way to share information is the exchange of messages

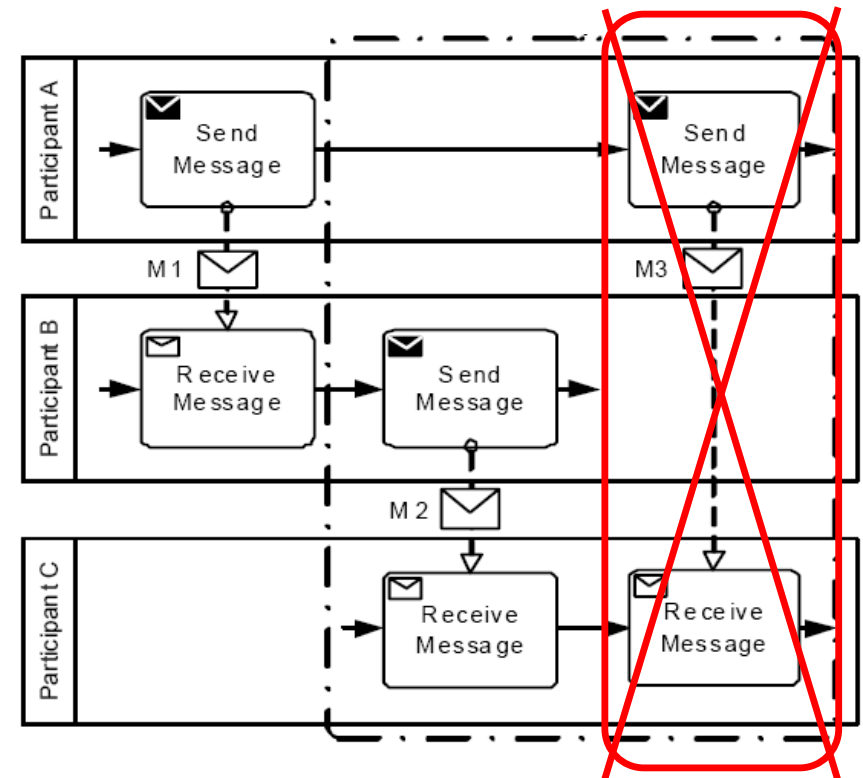


Choreography Sequencing Constraints

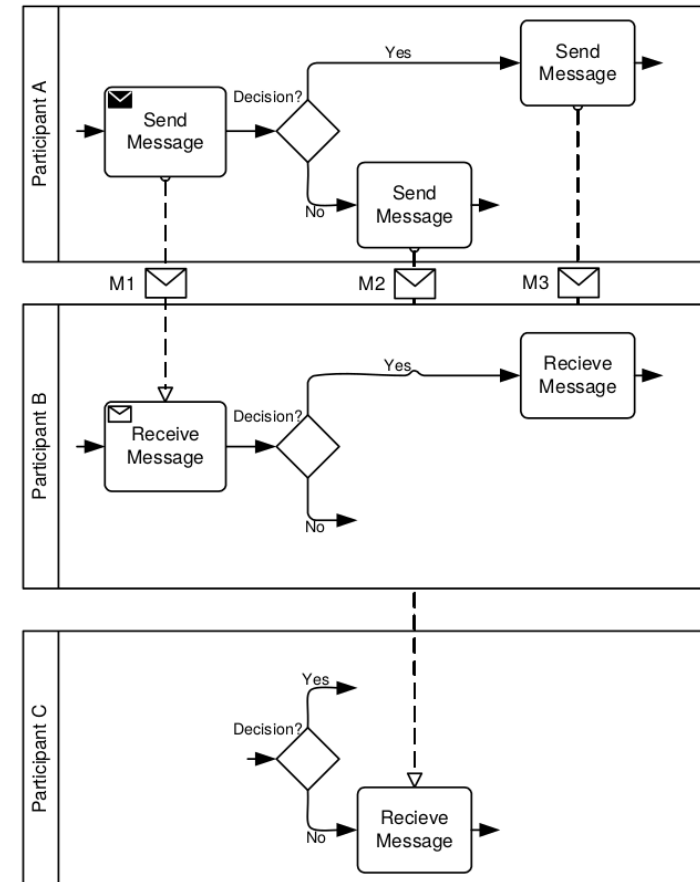
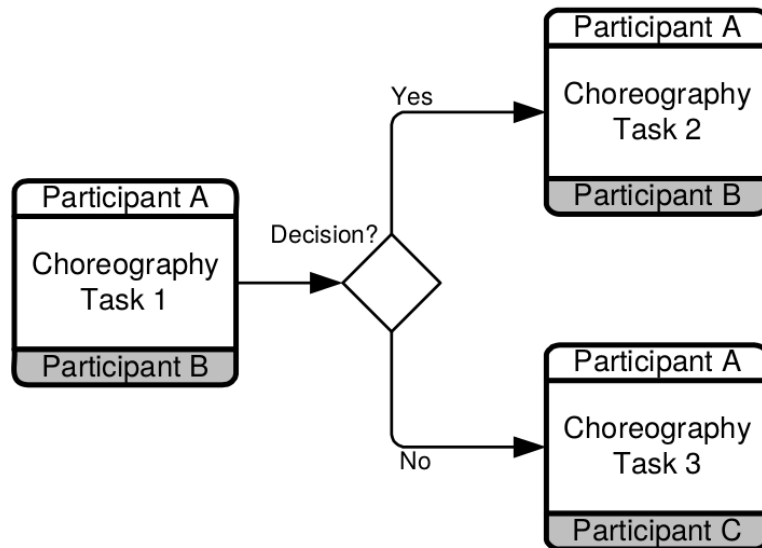
The initiator of a Choreography Activity must have been involved in the previous Activity (excluding first activity)



Why?!



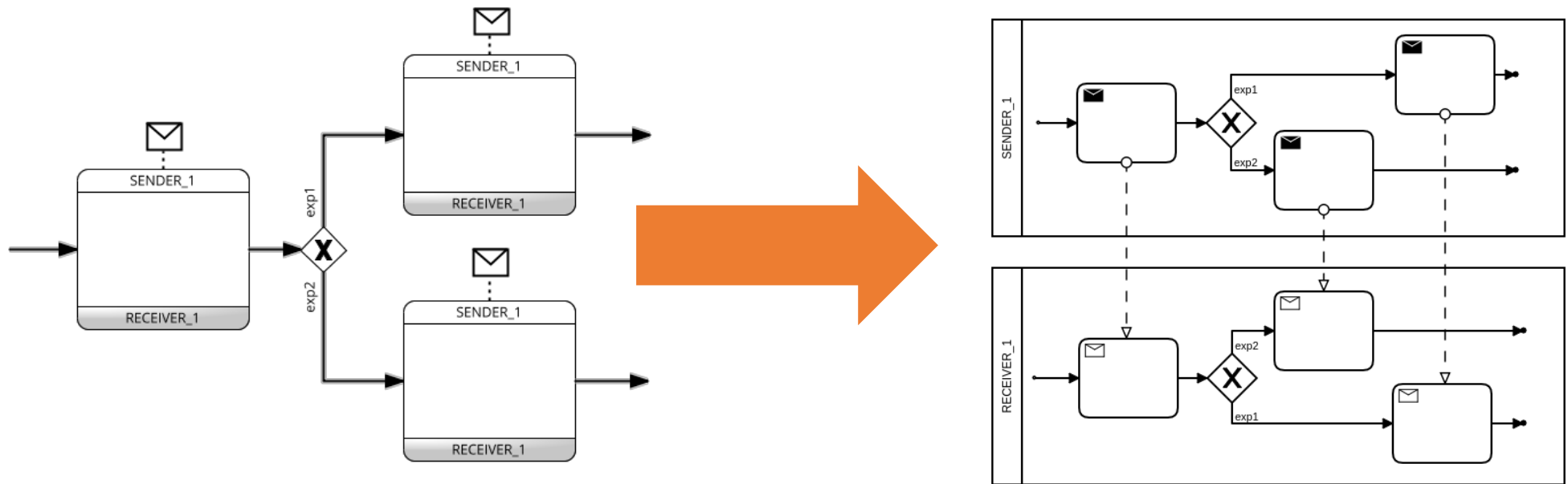
Decision and Exclusive Gateway from the Standard



The examples are not complete and in most of the cases does not substantiate the text

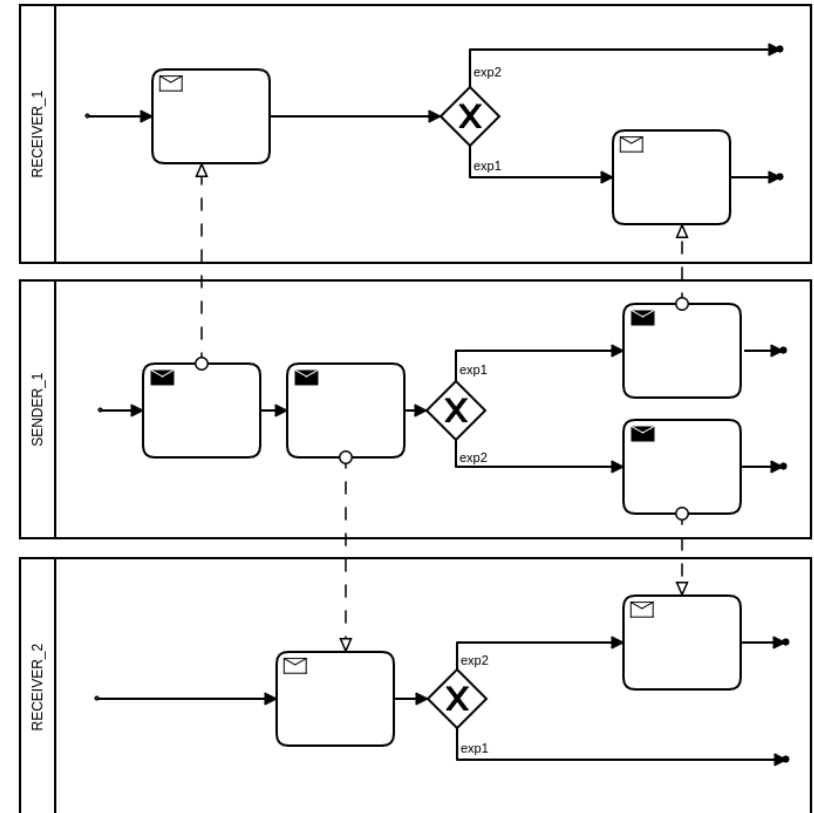
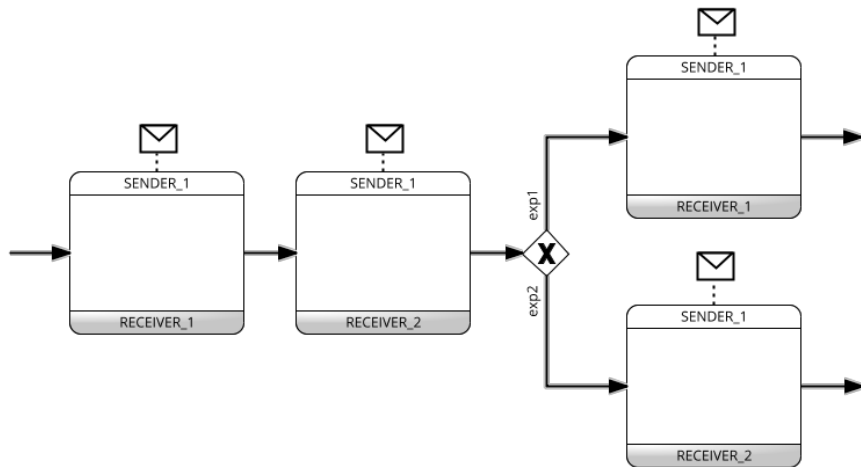
Exclusive Gateways

(i) same sender and same receiver



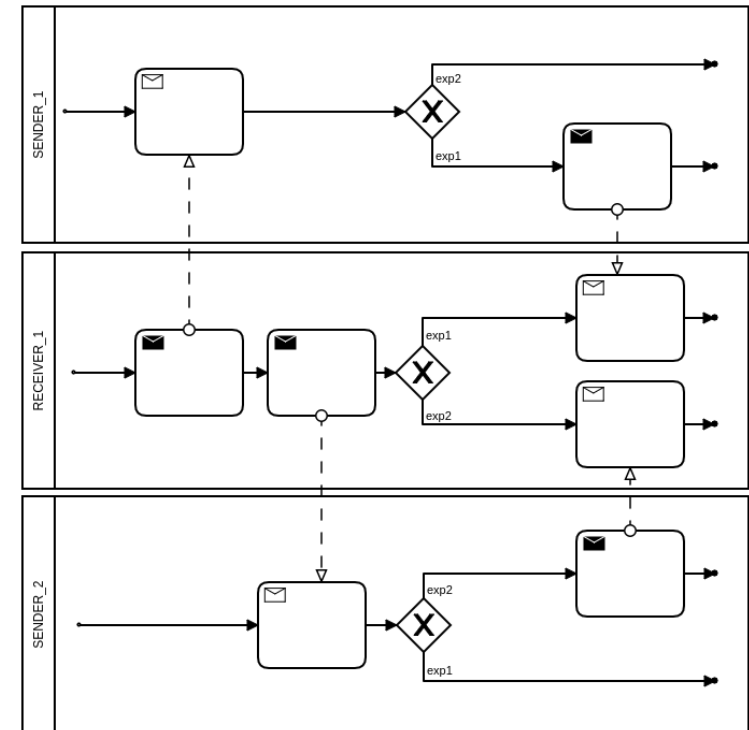
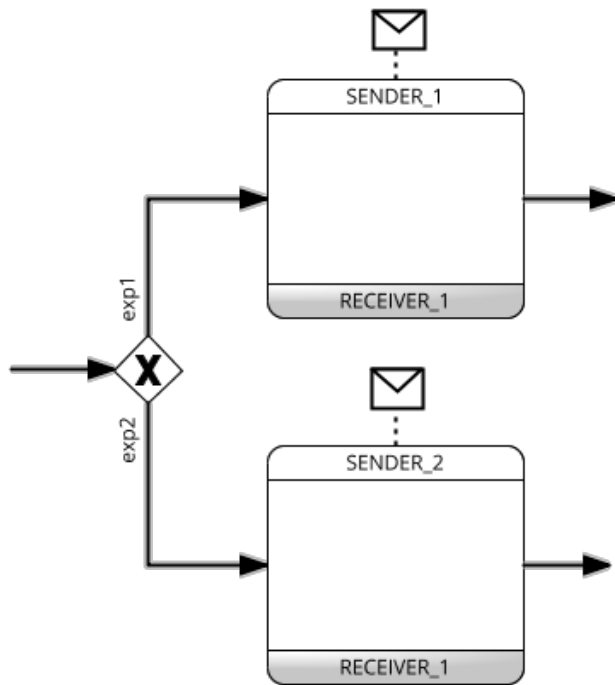
Exclusive Gateways

(ii) same sender and different receivers



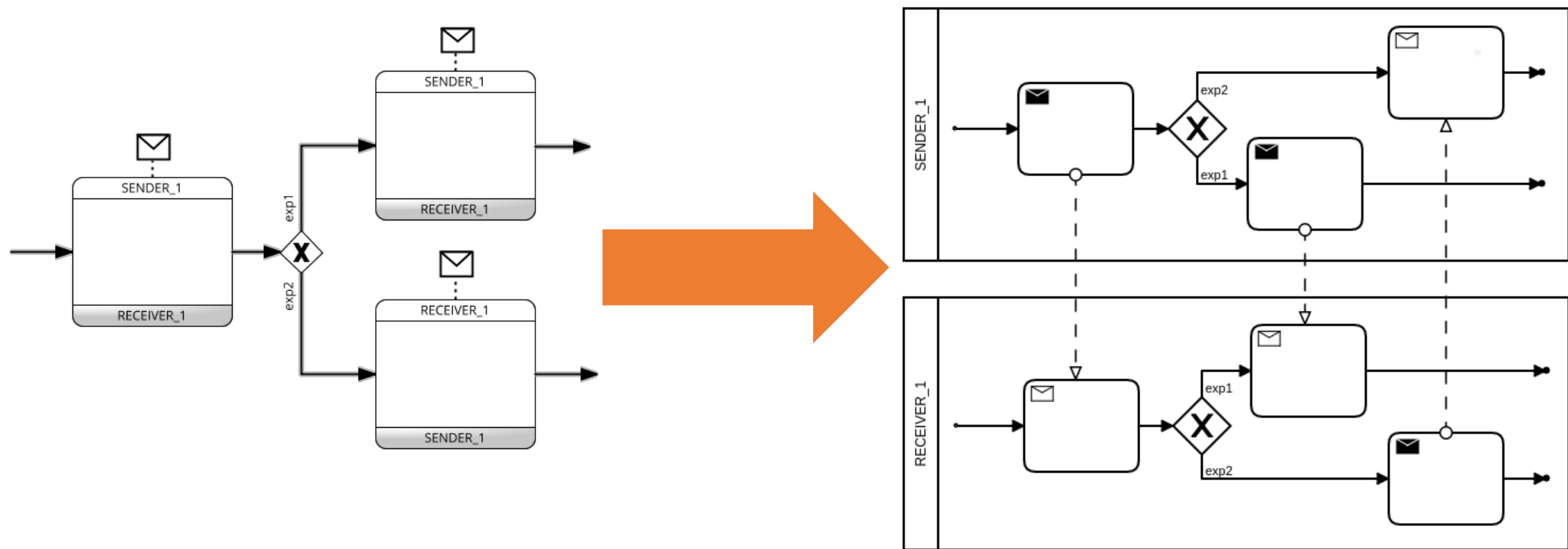
Exclusive Gateways

(iii) different senders and same receiver



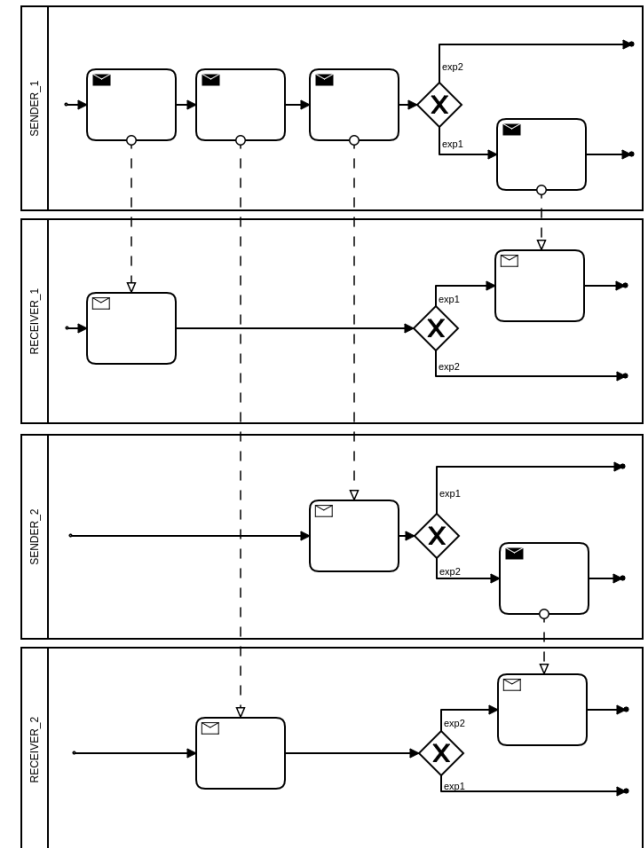
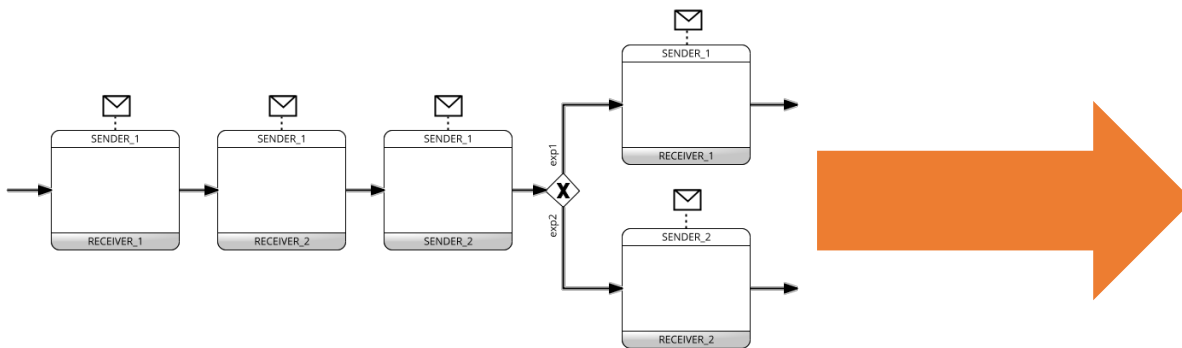
Exclusive Gateways

(iv) same sender and same receiver swapped

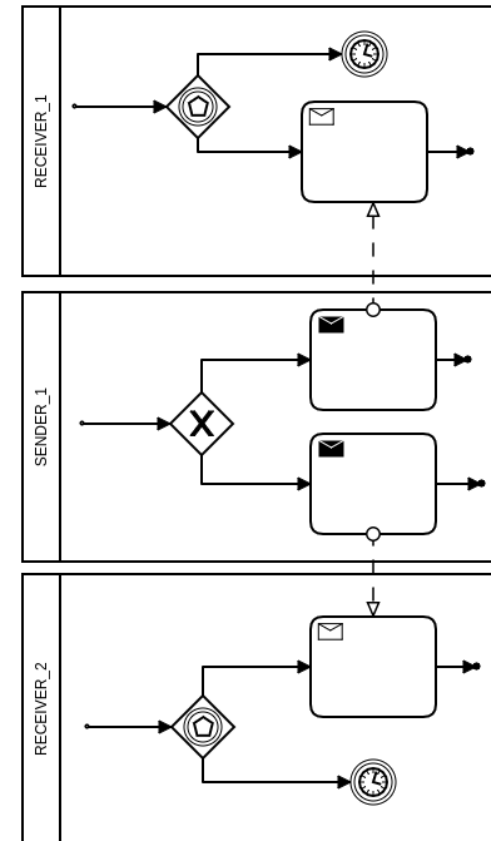
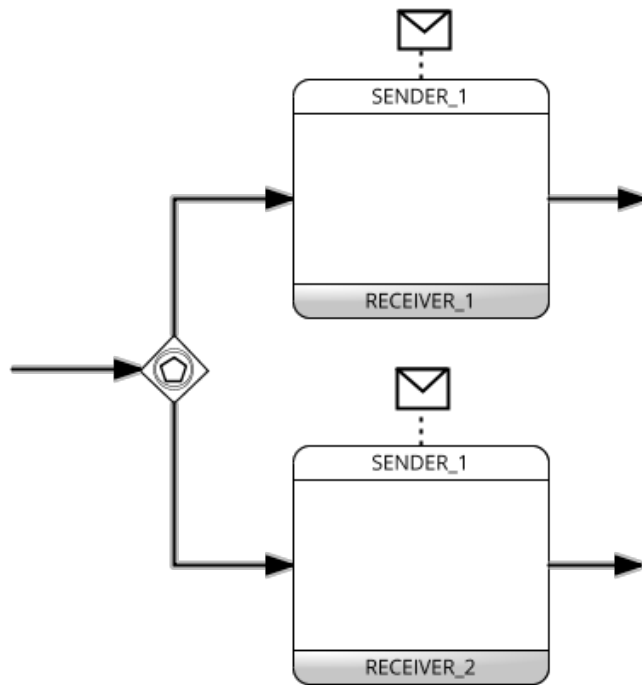


Exclusive Gateways

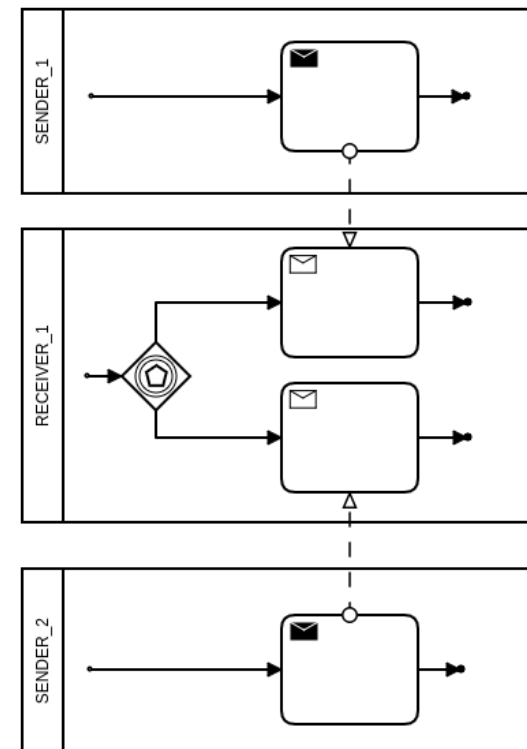
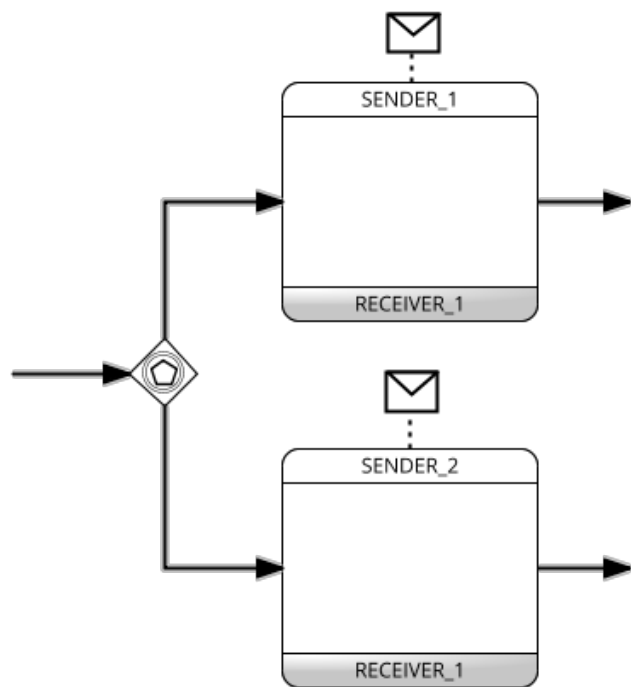
(v) different senders and different receivers



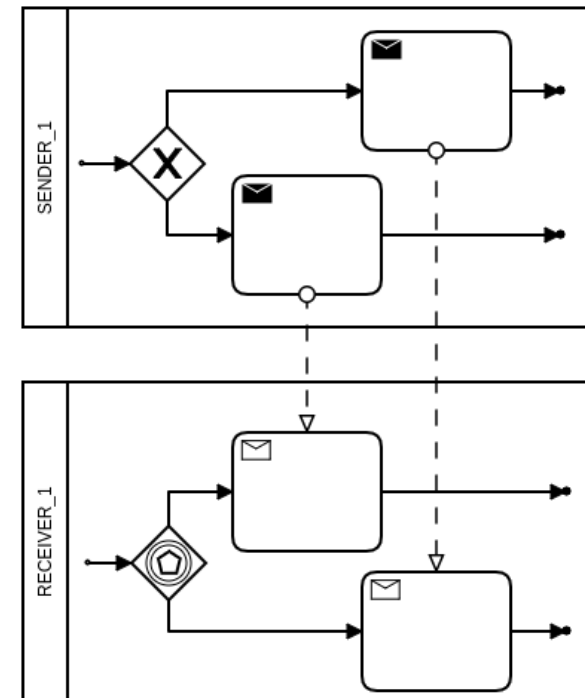
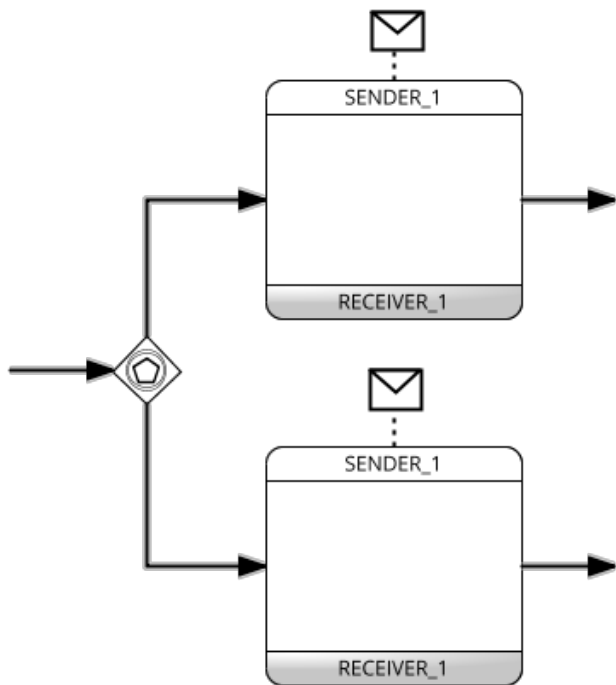
Event-Based Gateways (same sender and different receivers)



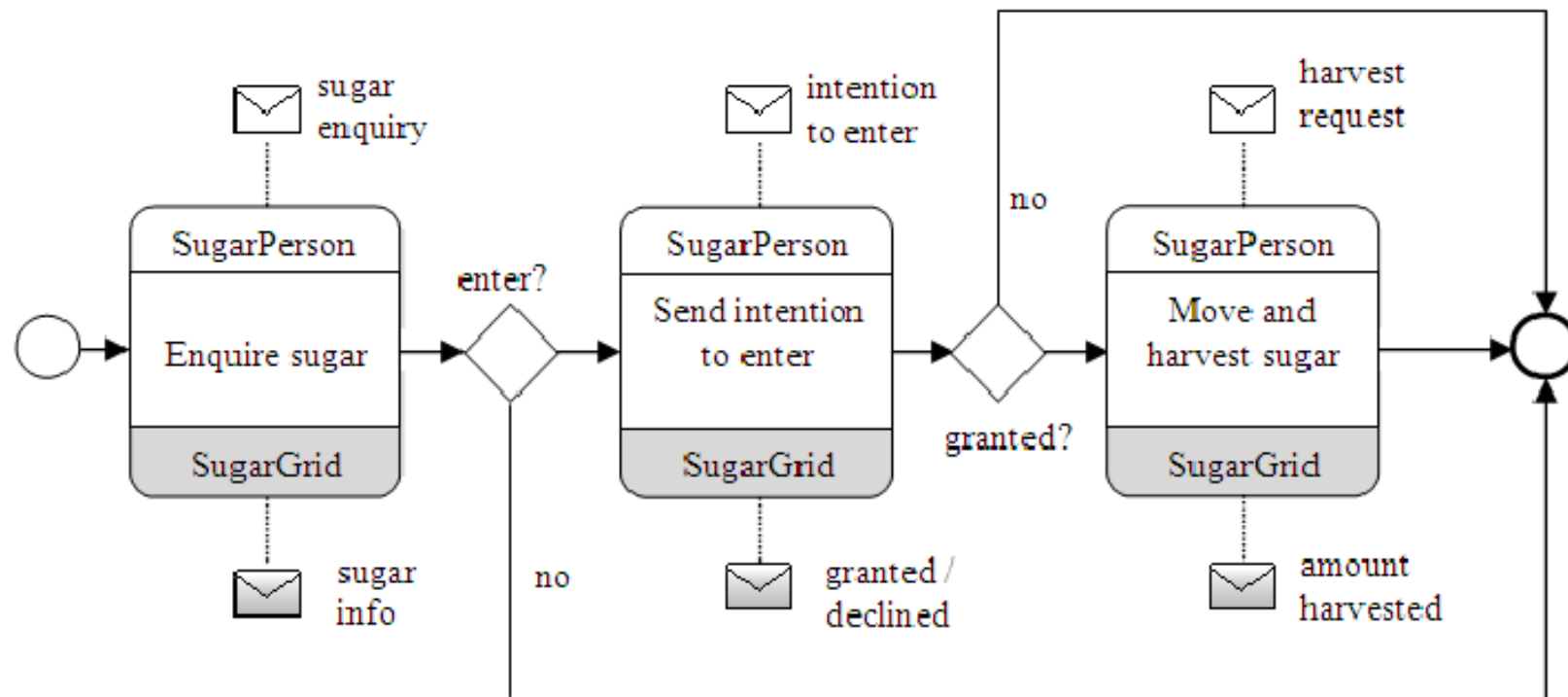
Event-Based Gateways (different senders and same receiver)



Event-Based Gateways (same sender and same receiver)

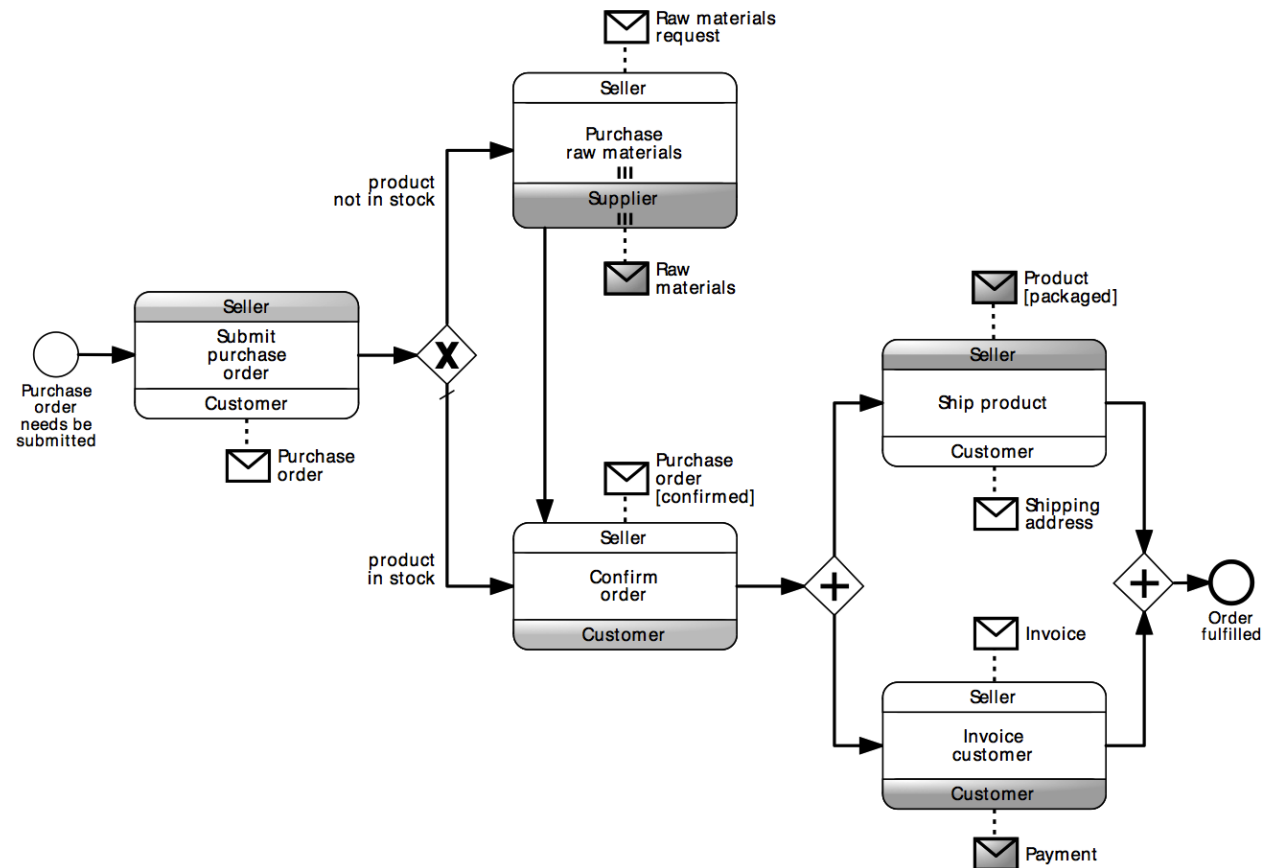


What is wrong in this model?

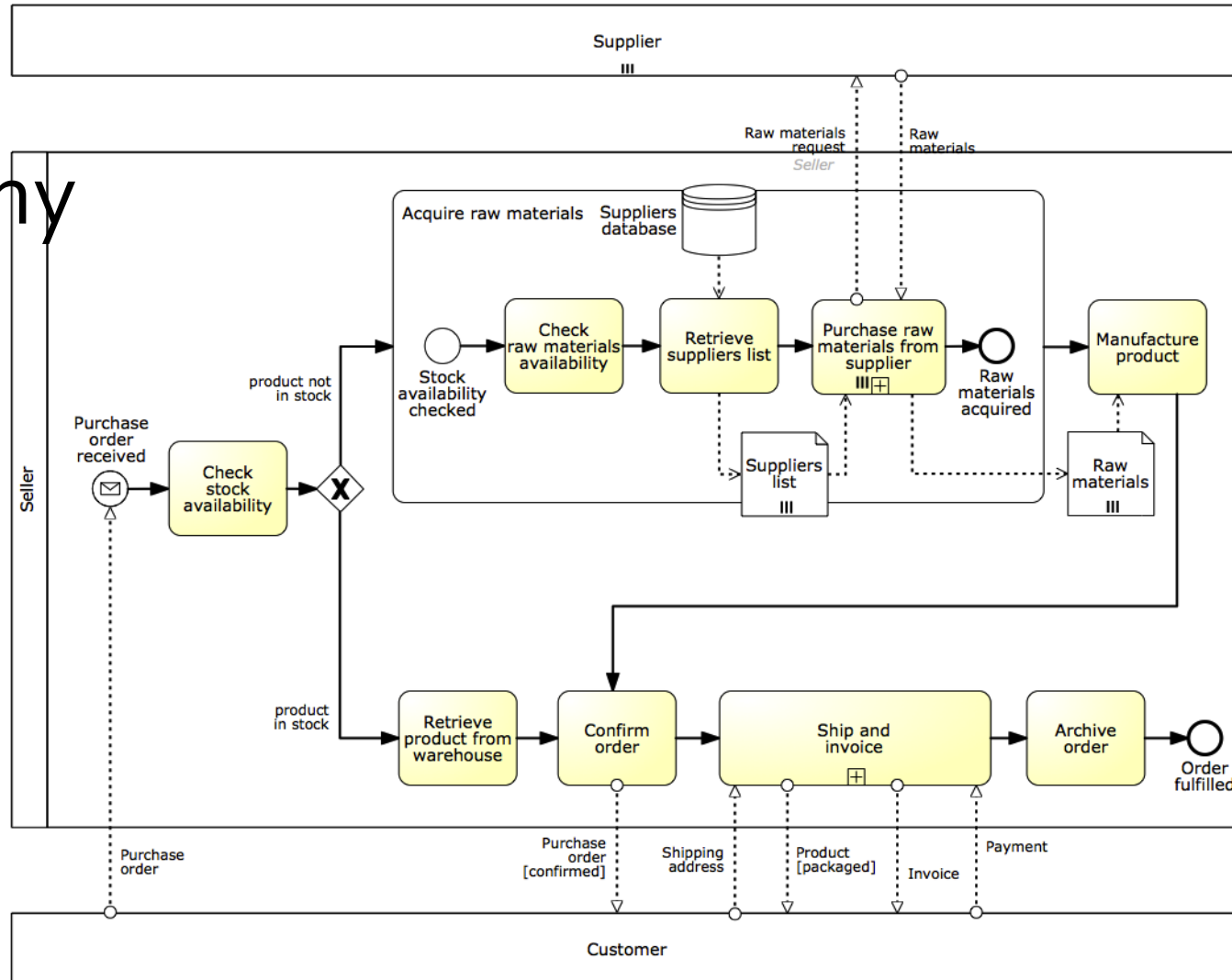


Example: Choreography

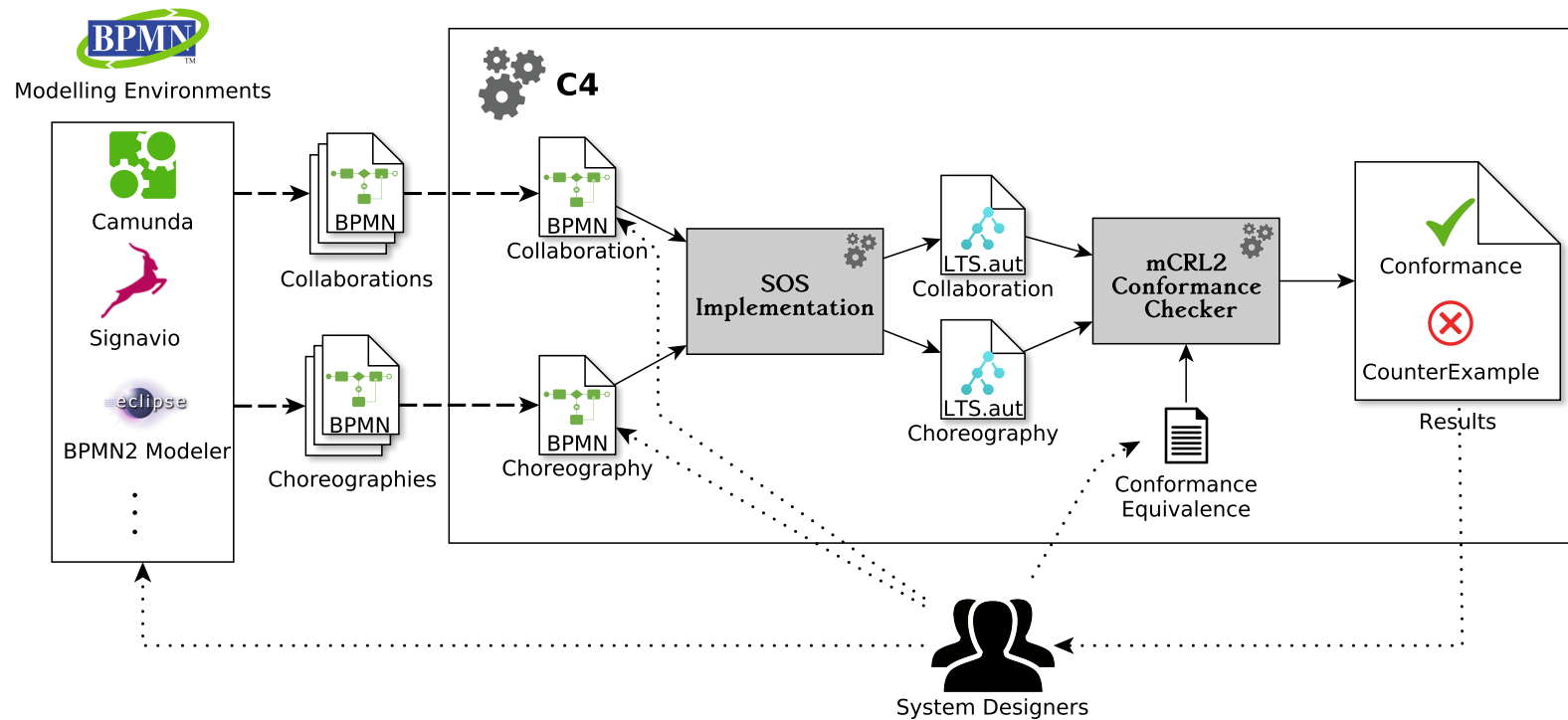
Use this diagram as a template to build the corresponding collaboration diagram

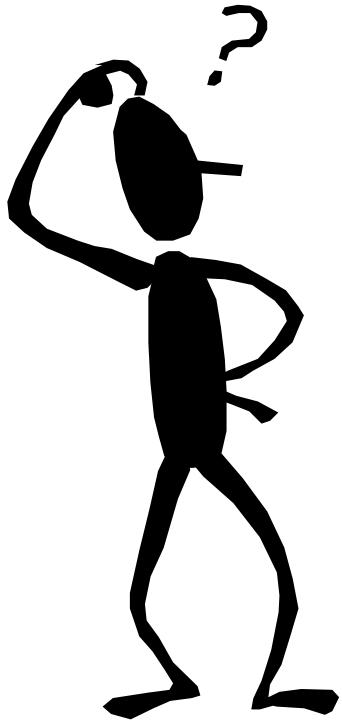


Example: Choreography



C₄ - tool





Questions?

F. Corradini, A. Morichetta, B. Re, and F. Tiezzi. Walking Through the Semantics of Exclusive and Event-Based Gateways in BPMN Choreographies. Springer. LNCS. The Art of Modelling Computational Systems: A Journey from Logic and Concurrency to Security and Privacy.