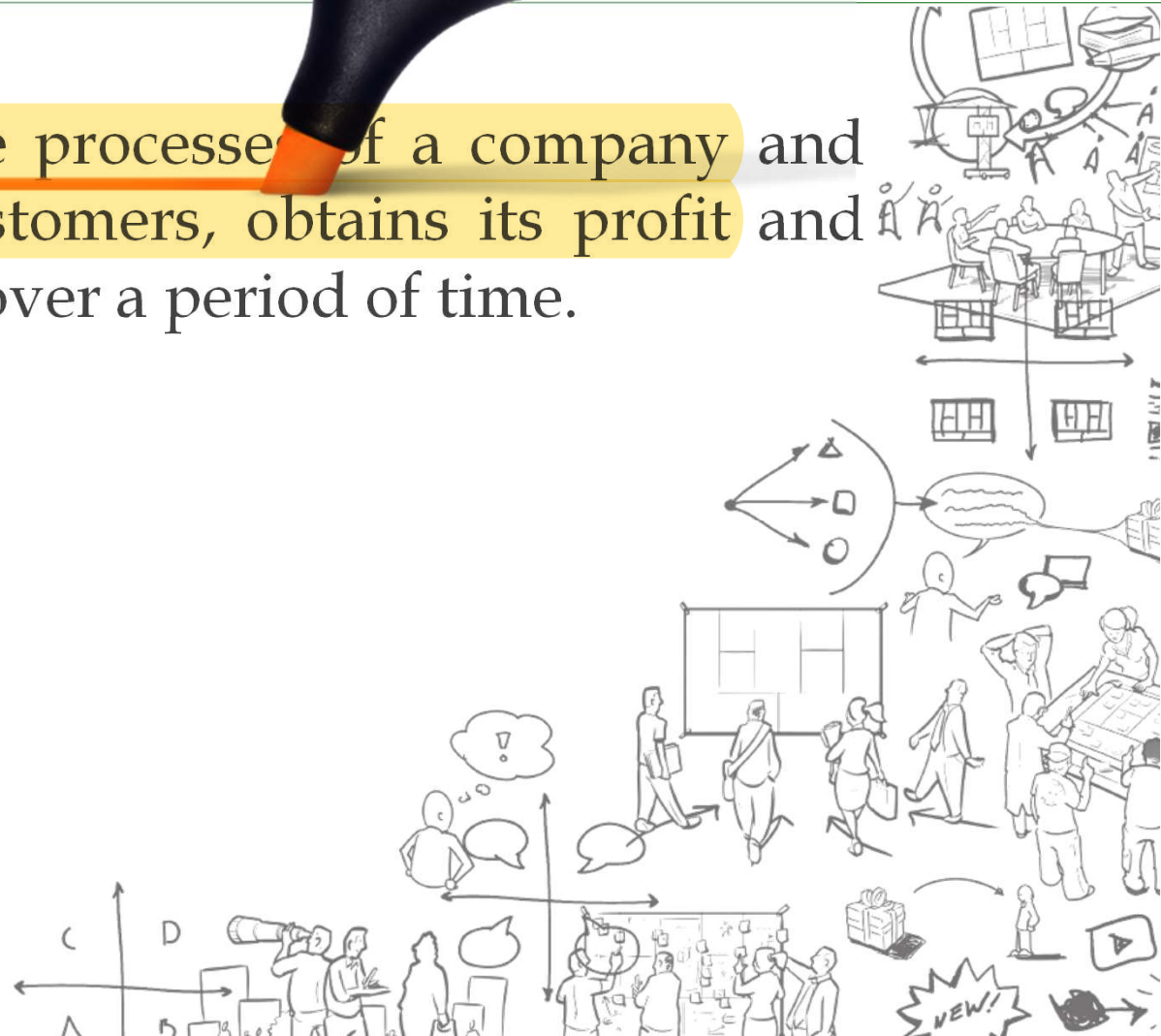# Business Process Modeling

Business Models

- It is the representation of the processes of a company and how it offers value to its customers, obtains its profit and remains in a sustainable way over a period of time.

REPRESENTATION OF PROCESSES

It is a group of activities (actions) that are in a logical sequence with the purpose of producing a good or a service that has value for a specific group of clients(HAMMER; CHAMPY, 1994).

VOLUME
MIN
MAX

– HAMMER, M., CHAMPY, J., "Reengineering the Corporation", New York: HarperBusiness, 1994.

Business Processes

- They are those that characterize the performance of the company and that are supported by other internal processes, resulting in the products or services that are received by the customers (GONÇALVES, 2000).

  – GONÇALVES, J. E. L., "As Empresas são Grandes Coleções de Processo", RAE - Revista de Administração de Empresas, v. 40, n. 1, p. 6-19, jan/mar. 2000.

Introduction to BPMN 2.0
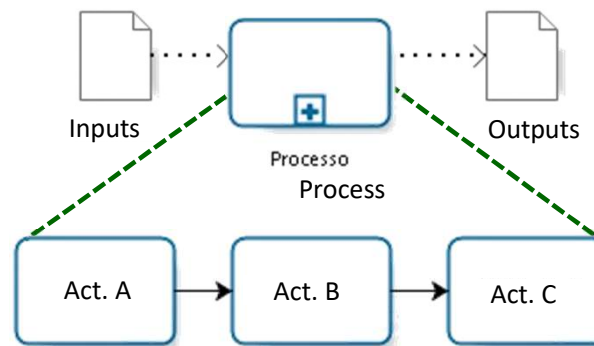
Denis S. Silveira/João Araujo

Basic Elements

- *The Business Process Modeling Notation – BPMN is rich in modeling elements*
  - However, from subset of basic elements it is possible to do a good modeling work
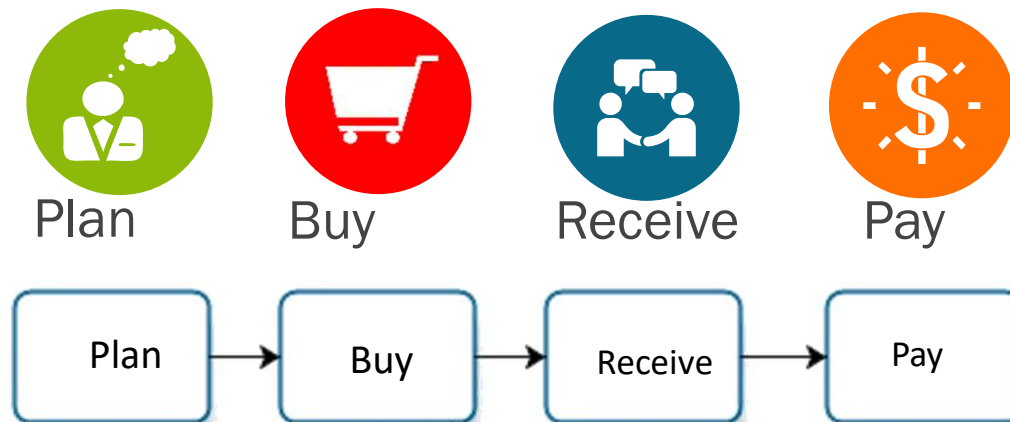
PROCESS

- It is a sequence of activities with a specific purpose.

- It exists to get and process inputs and to produce outputs.

- To transform the inputs into outputs is necessary to carry out a work / action.

Inputs   Processo Process   Outputs

Act. A → Act. B → Act. C

ACTIVITY

- The work, described by a sequence of steps, is here called activity.
  - Consider the process of acquiring goods or services

Plan   Buy   Receive   Pay
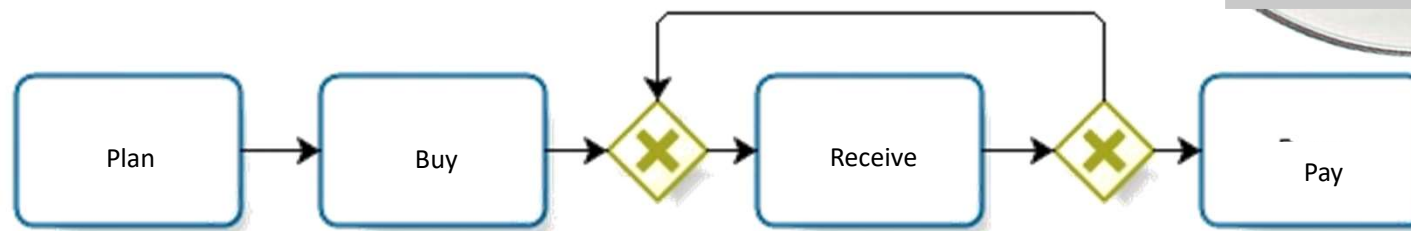
| Plan | → | Buy | → | Receive | → | Pay |

Modify the flow

- Often we have the need to represent exceptions in a process
  - An exception is the ocurrence of a flow different from the natural path of a process

  - What would happen if an organization received a good or service different from what was planned?

MODIFY THE FLOW

- What if the organization received a good and / or service different from what was planned
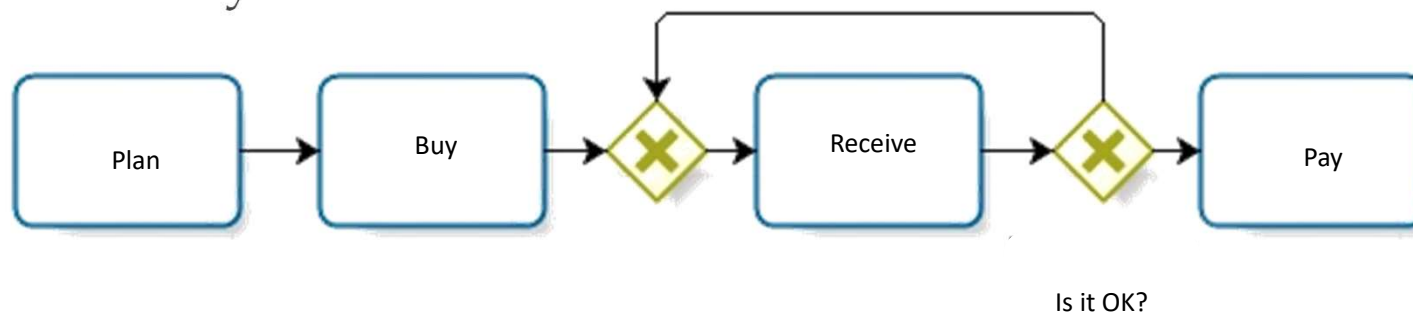
Is it OK?

Plan → Buy → ✖ → Receive → ✖ → Pay

Is it OK?

- The diamond is called, in BPMN, *gateway*

GATEWAY

- *gateways* serve to carry out the divisions and junctions in a flow. That is, they give flexibility to flows
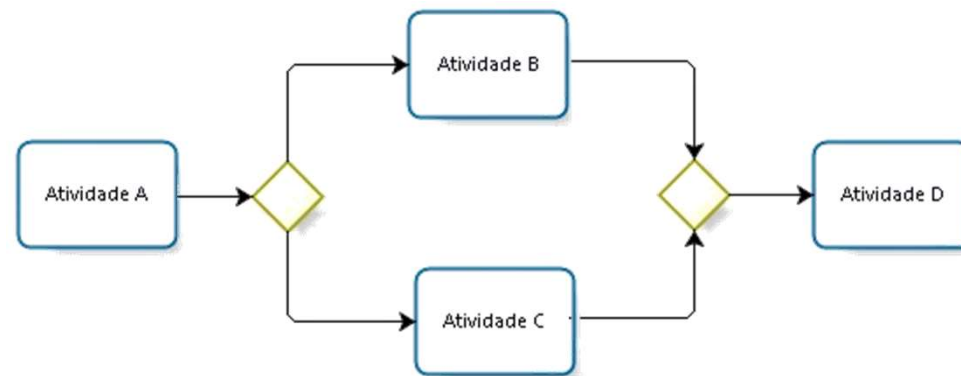

Exclusive   Exclusive   Inclusive   Parallel   Event based   Complex

- Good practice recommends keeping only one input and one flow output for each activity
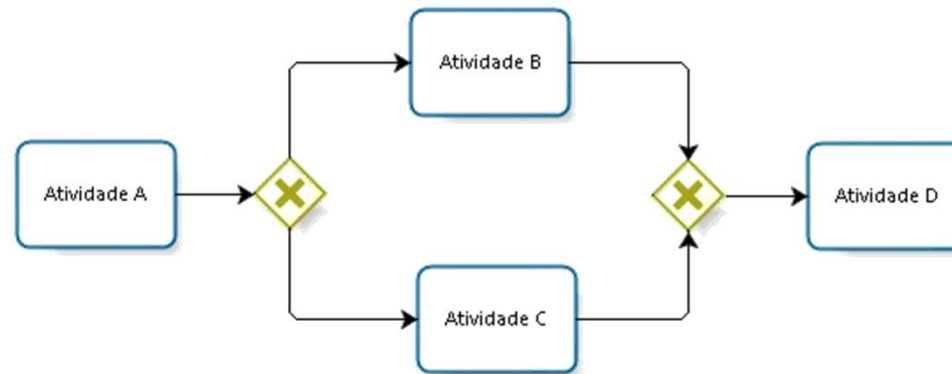

Plan → Buy → ✕ → Receive → ✕ → Pay

Is it OK?

GATEWAY

- They are used to provide flexibility in the flow of activities, making it possible to follow different paths.
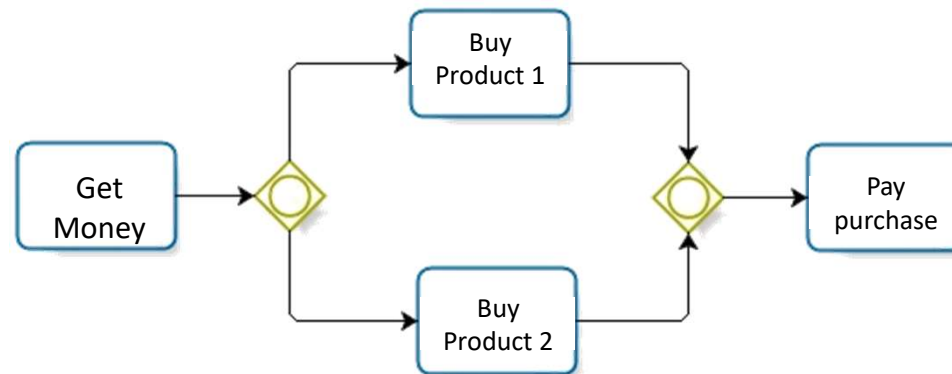
EXCLUSIVE *GATEWAY*

- It can be represented by a simple diamond or with an "X" inside
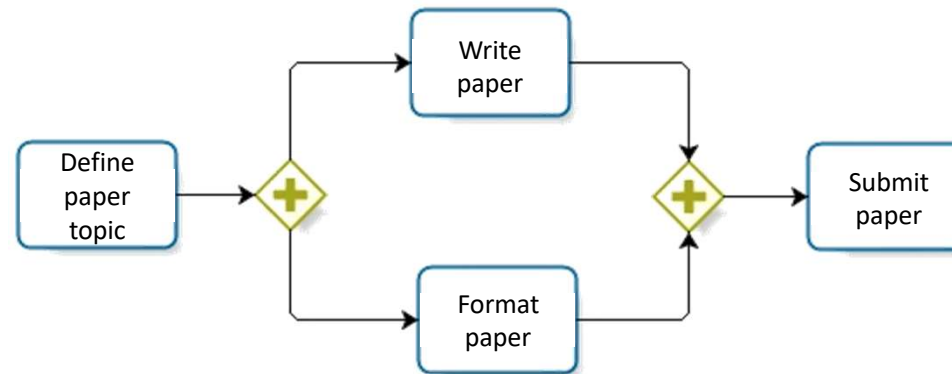
INCLUSIVE *GATEWAY*

- Represented by a circle within the diamond; means taking one of the paths or both paths.

- In this case it is possible to buy only the product 1, the product 2 or both.

PARALLEL *GATEWAYS*

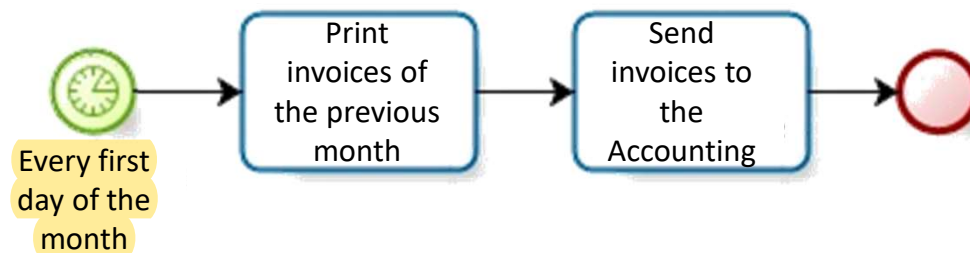- There is an obligation to follow the two paths simultaneously.

- In this case, the gateway is represented by a "+" sign inside the diamond.

EVENTS

- Events increase understanding of the model and should be used whenever we need to highlight a particular occurrence in a process.
- The most typical cases are the start and end events of a process, but can be used in other situations.
- The events are classified, in a very general way, in:

  - ◯ start events
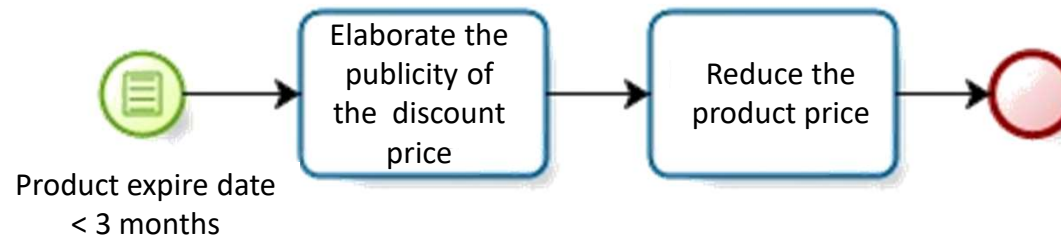 - ◯ intermediate events
  - ◯ end events

TIMER START EVENTS

- A process can be initiated by a time event

- Something that happens every time period or on a specific date

- The event is described as a clock in the center of the circle

Every first day of the month → Print invoices of the previous month → Send invoices to the Accounting →
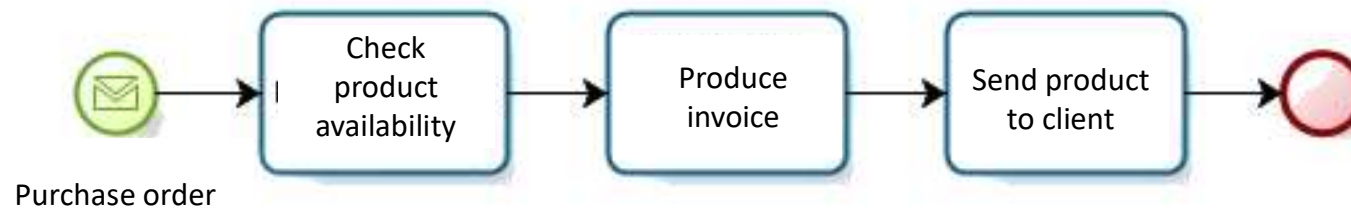
Conditional Start Events

- A process can also start depending on a certain condition (business rule)

- This condition must be represented by an expression (Boolean) that, when true, causes the process to begin
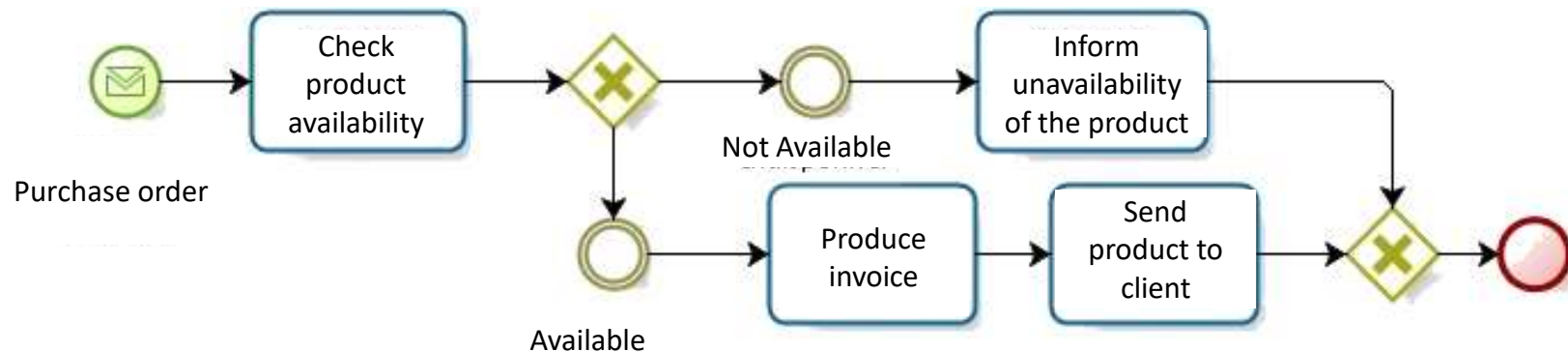

Product expire date < 3 months

Elaborate the publicity of the discount price

Reduce the product price

Message Start Events

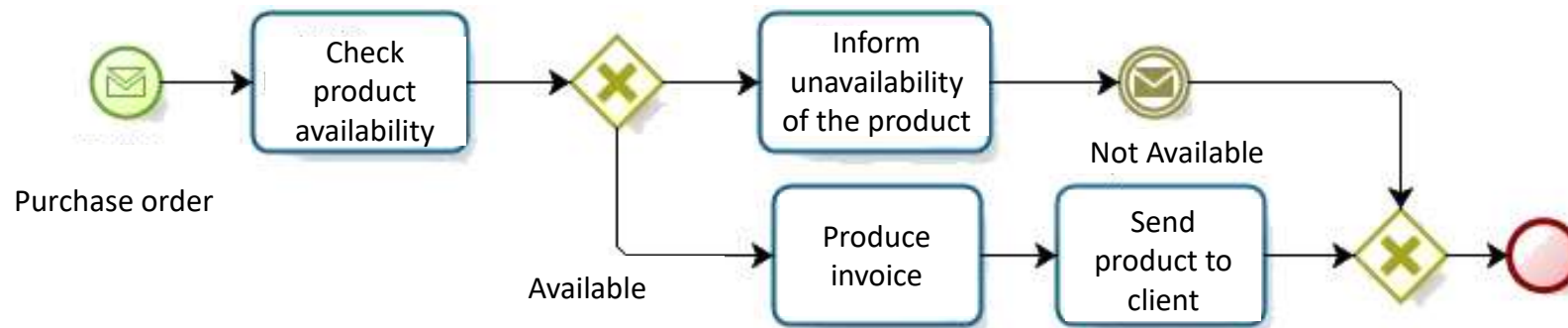- Another possibility is that a process is initiated based on a message

Intermediate Events

- They represent the simple events that occur in a process, such as the indication of availability or unavailability of a requested product, for example.
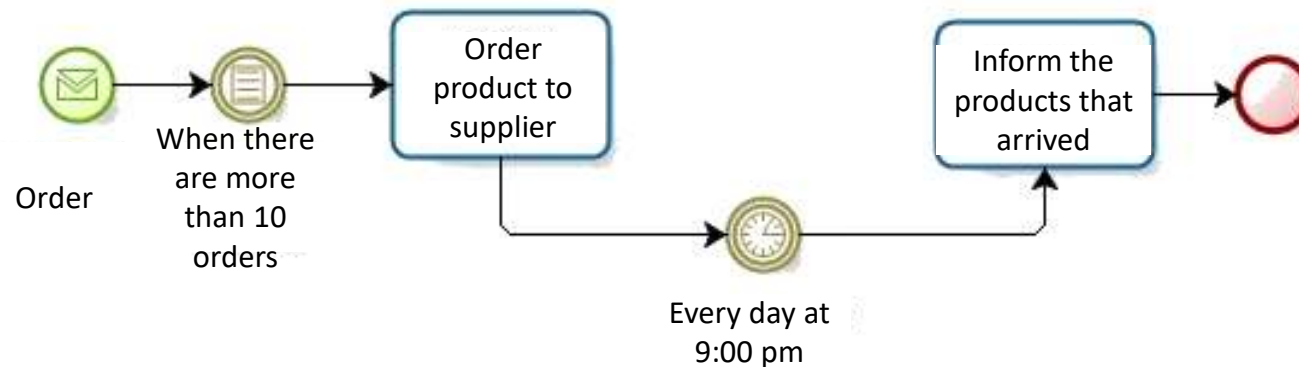
Intermediate Events

- Intermediate events of the type "message" represent the sending and / or receiving of information among the process participants
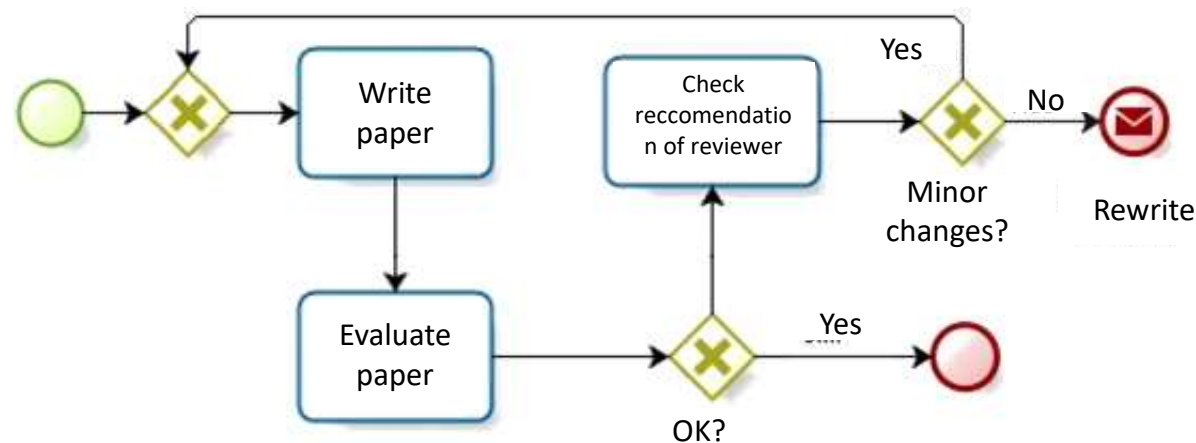
EVENTOS INTERMEDIÁRIOS

- Intermediate events may also serve to interrupt the flow depending on a particular condition or time
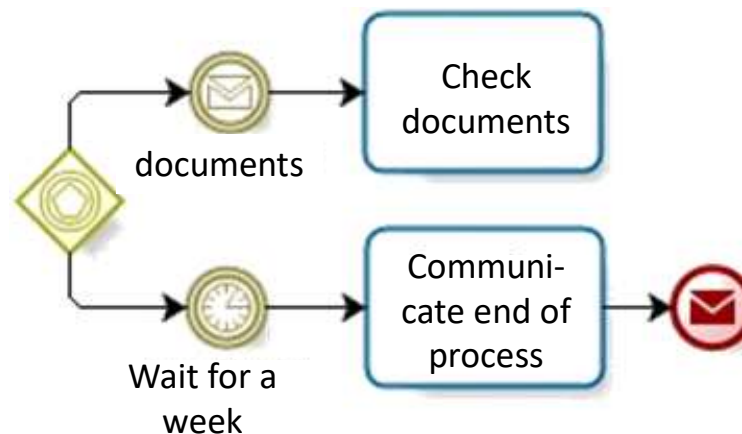

Modelagem de Processos

- The standard final event is represented as an empty circle with a thicker line.

- But just like the previous ones (start and intermediate), more specific types are represented with a drawing inside the circle.
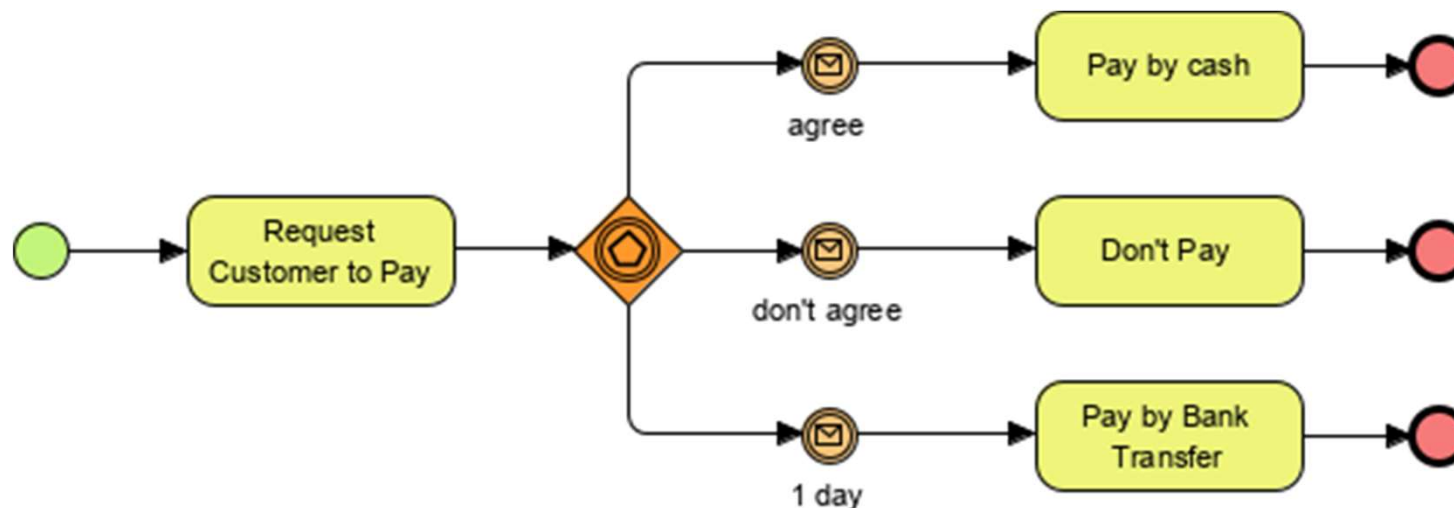
Event-based Gateway

- There is a possibility that more than one event may occur in a given situation

- For example, wait for a document by a certain date to continue the process. In this case, the process may have continuity by the arrival of the document or by the deadline
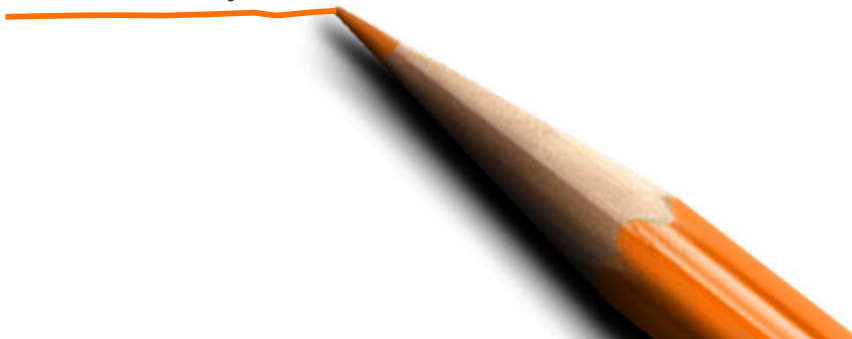
Exercise: Event-based Gateway

- Draw a model where after requesting a customer to pay, the system waits for the answer which can be:

  - agree and then pay by cash,

  - do not agree and do not pay, and
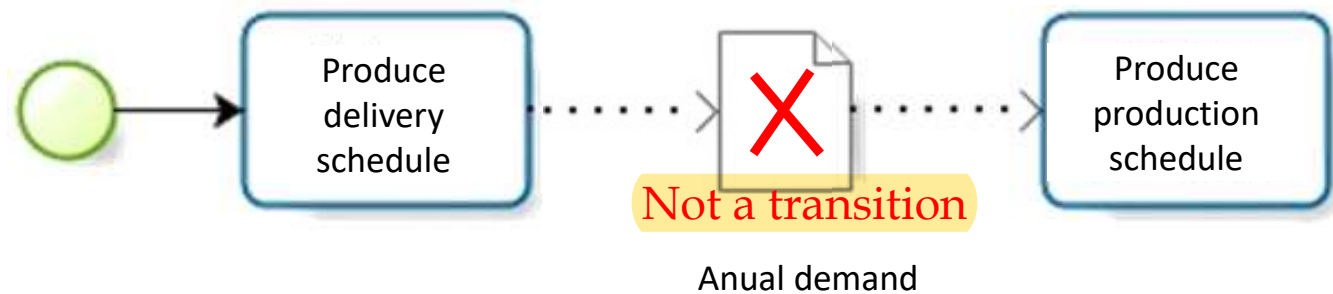
  - wait for 1 day to pay by bank transfer

Data Objects

- The link between two activities occurs through the transmission of data / information, since the responses (information) produced in one activity can be consumed in another activity.

- Data and information are elements that unify all activities in a process

- In BPMN we call them *Data Object*.

DATA OBJECT

Input data   Activity   Output data

Produce delivery schedule

Not a transition

Anual demand

Produce production schedule

Modelagem de Processos

DATA OBJECT

DATA OBJECT

Plan

Buy

Receive

Pay

Purchase Plan

Order

Invoice

Complaint received

Confirmation received

OK?

But who does what?
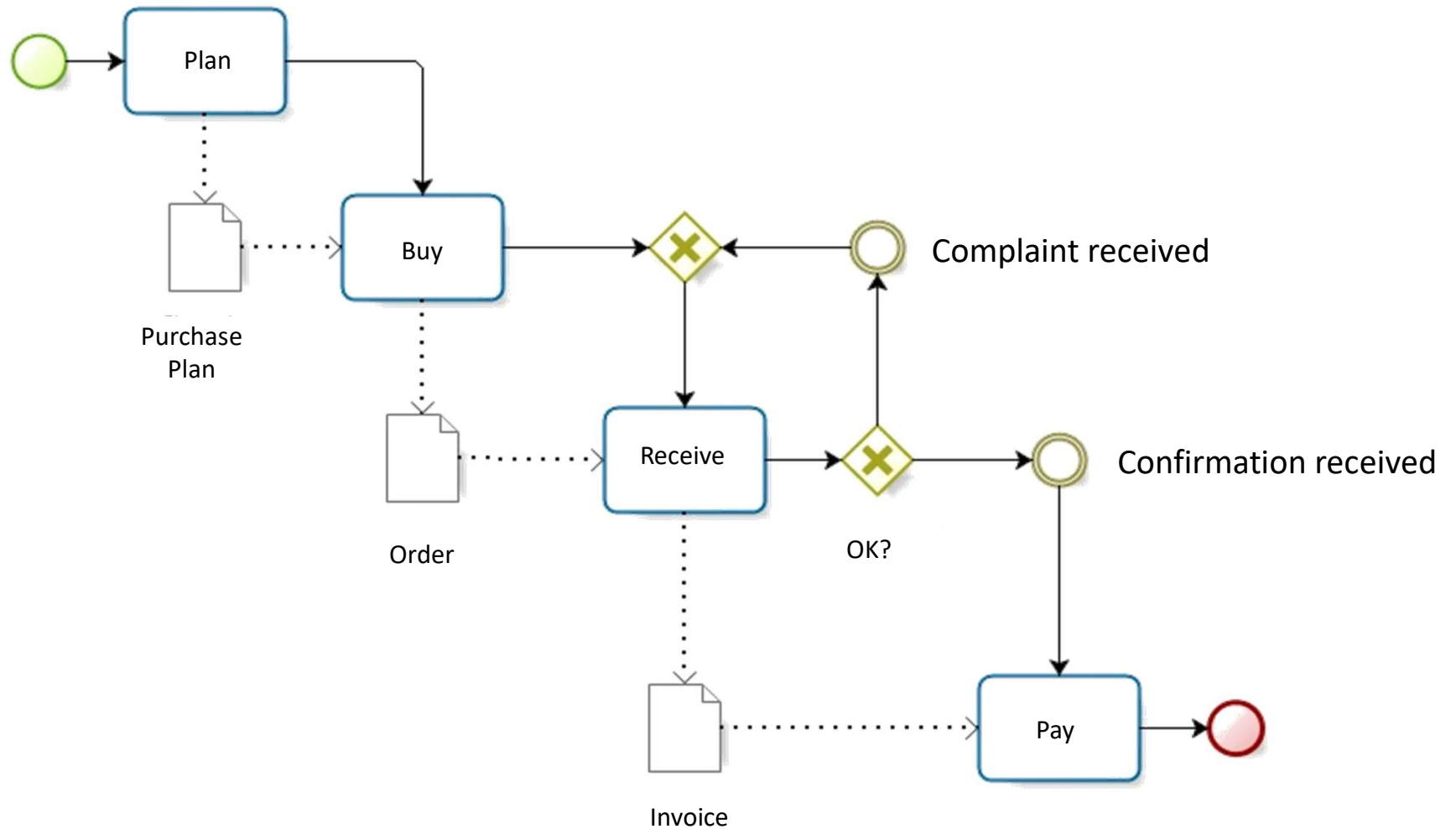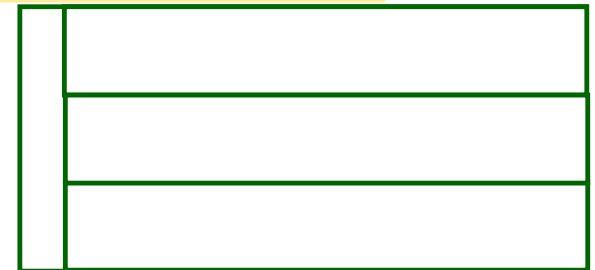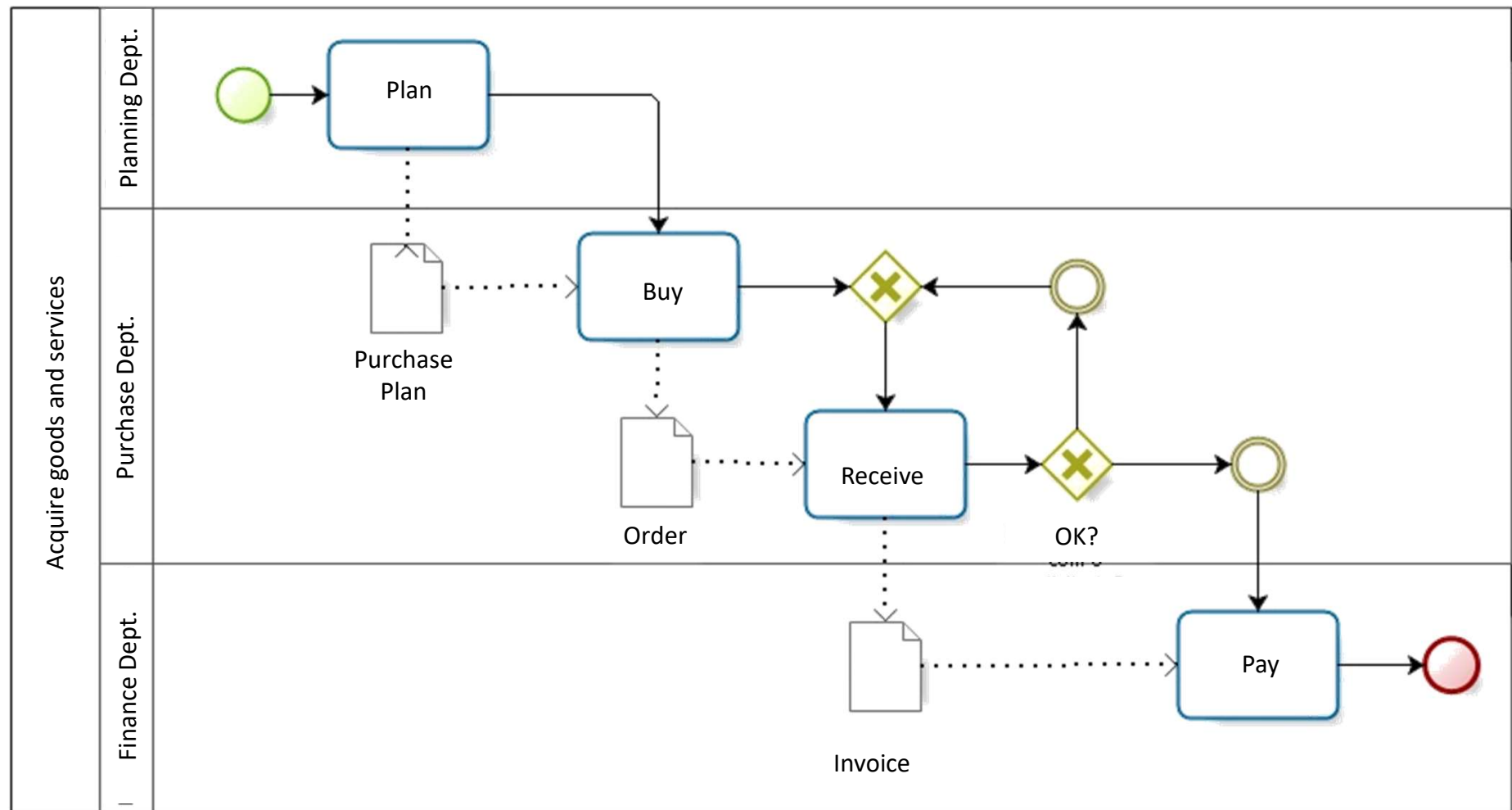
- Who are the actors who carry out the processes / activities ?

- *Pool* and *Lane*

  - To explain the actors of a process, we first add a Pool, which is a rectangle representing the process itself

- Within this rectangle we place smaller rectangles, the Lanes, each of them representing (the role of) the actors

Pools and lanes

Modelagem de Processos

ACTIVITY or PROCESS

- What is the difference between process and activity

- Depends on the context

  - If an activity contains other activities then it is a process. If it does not contain other activities within it then it is just an activity

Modelagem de Processos

Activity or Process

Modelagem de Processos

Activity or Process

Purchase Plan

Group order items

Rank the suppliers

Choose best supplier

Order

Activity or Process

Modelagem de Processos

Activity or Process

- In general, we have two types of subprocesses:

  - *Embedded Subprocess*, which aims to better explain an activity, as presented in the previous slide

  - *Call Activity*, which represents a subprocess that can be called from several other processes. The advantage of this type of subprocess is to be independent (low coupling), being able to have its own pool and its own lanes,

Information between processes

- When modeling a process it is important to remember that there are different perspectives on this same process

- For example, in a business transaction between two companies (B2B), for one company the process is buying, but for the other company that same process is the sale
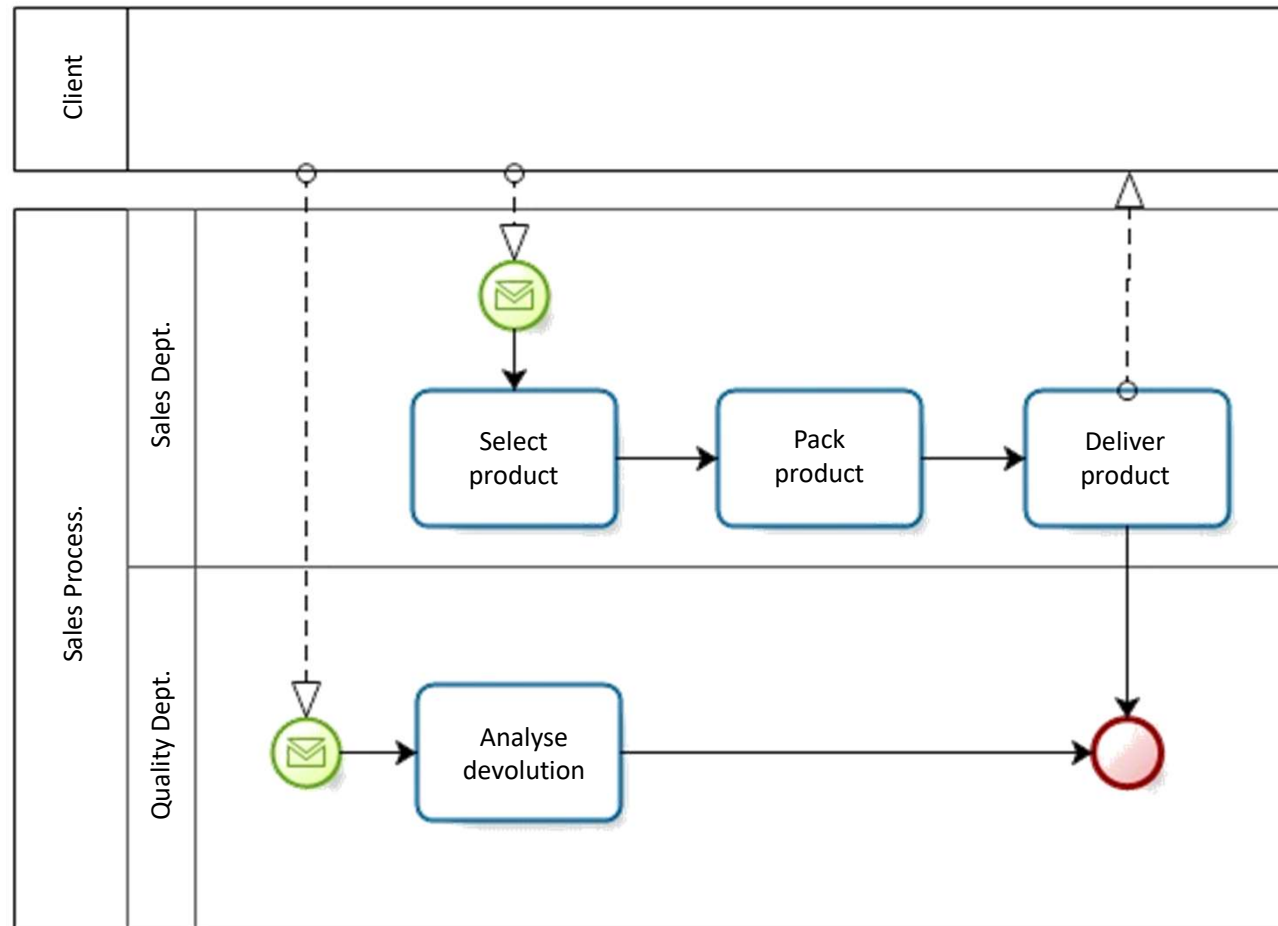
Information between processes

- The pool was presented to identify a process, and within it we placed the lanes, which represent the participants of a process, being these internal participants to the process.

Information between processes

- However, a process communicates with external participants, who do not perform the process activities, but who demand and receive information from that process.
- Then, to represent the internal participants, we used lanes, but to represent the external participants we also used **Pools**

Information between processes and collaboration

Modelagem de Processos

Messages

- Message exchange is a key element in resolving conflicts in process models.

- Each message exchange indicates a point of contact between the modeled process and an external participant, and it is precisely at these points of contact that many problems occur, such as delays, biases, inefficient mechanisms, among others.

Example- Real State

- The process starts with the owner's request for evaluation of the property. After registration of the request, with the registration of the property and the owner, the property evaluation is scheduled and the documentation sent to the legal department for verification. If the documentation is irregular, the process is terminated; otherwise, the valuation of the property is carried out by the broker, as scheduled.
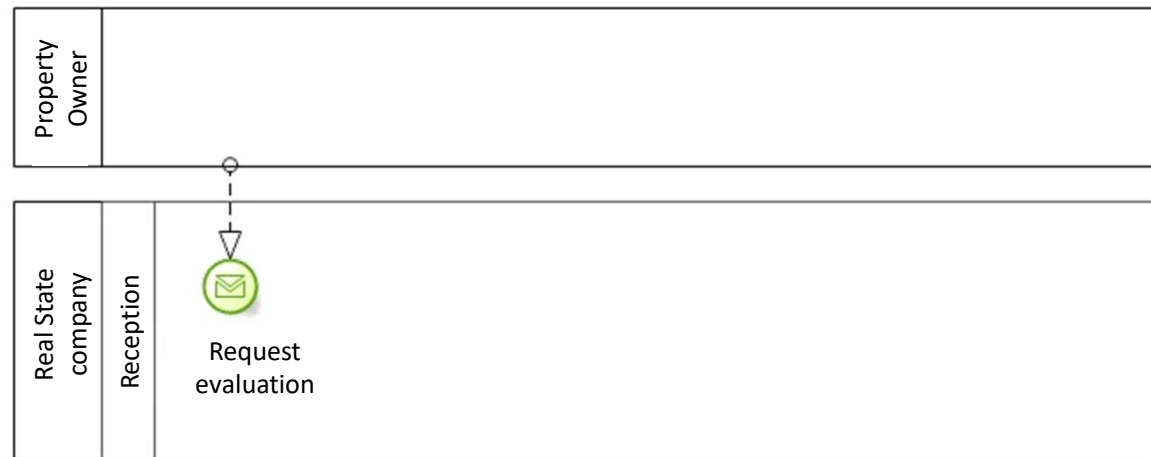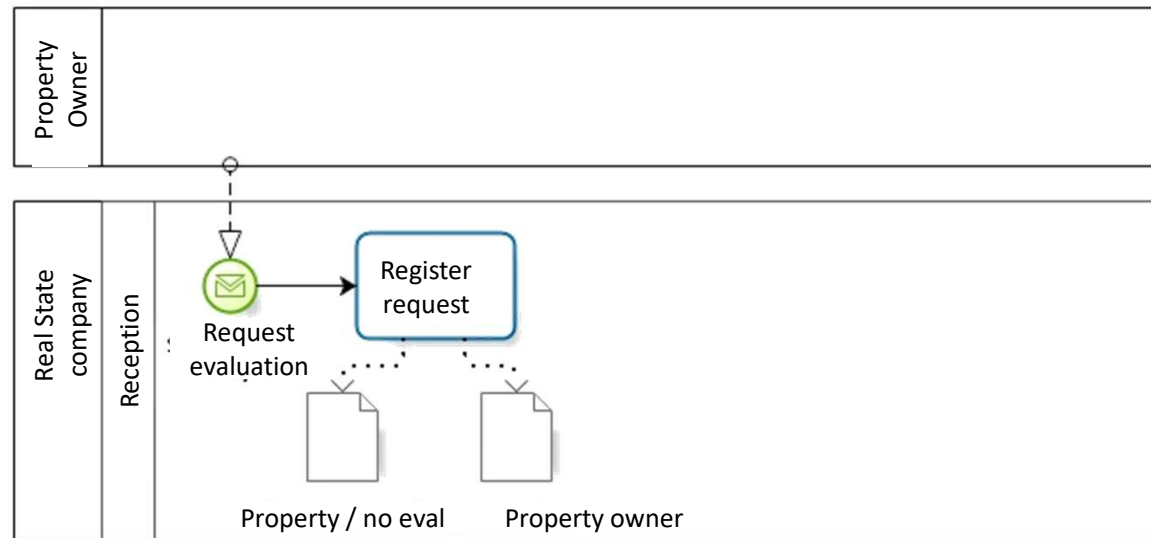
Example- Real State

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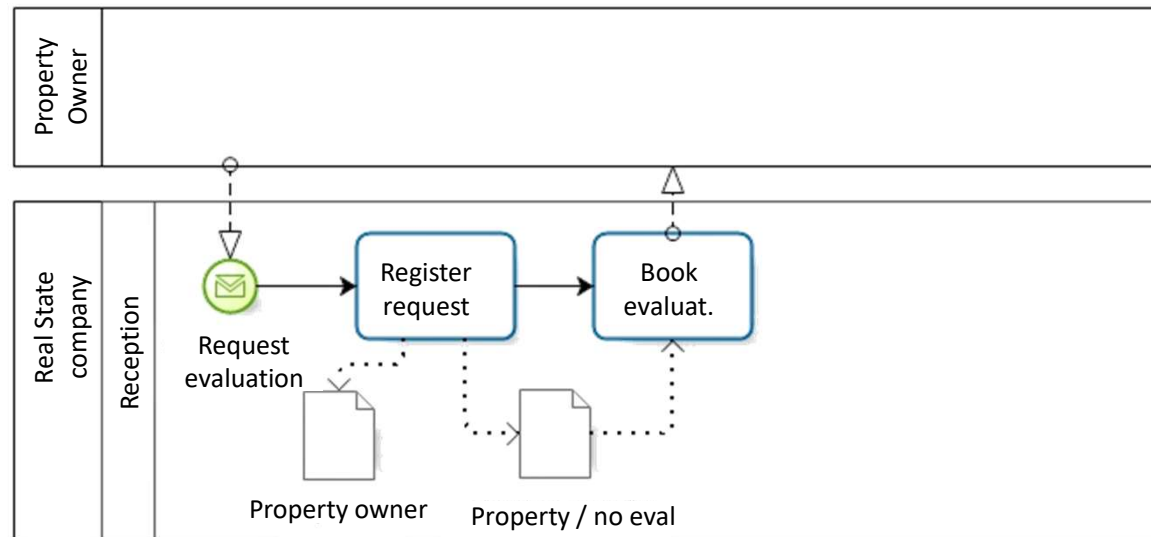
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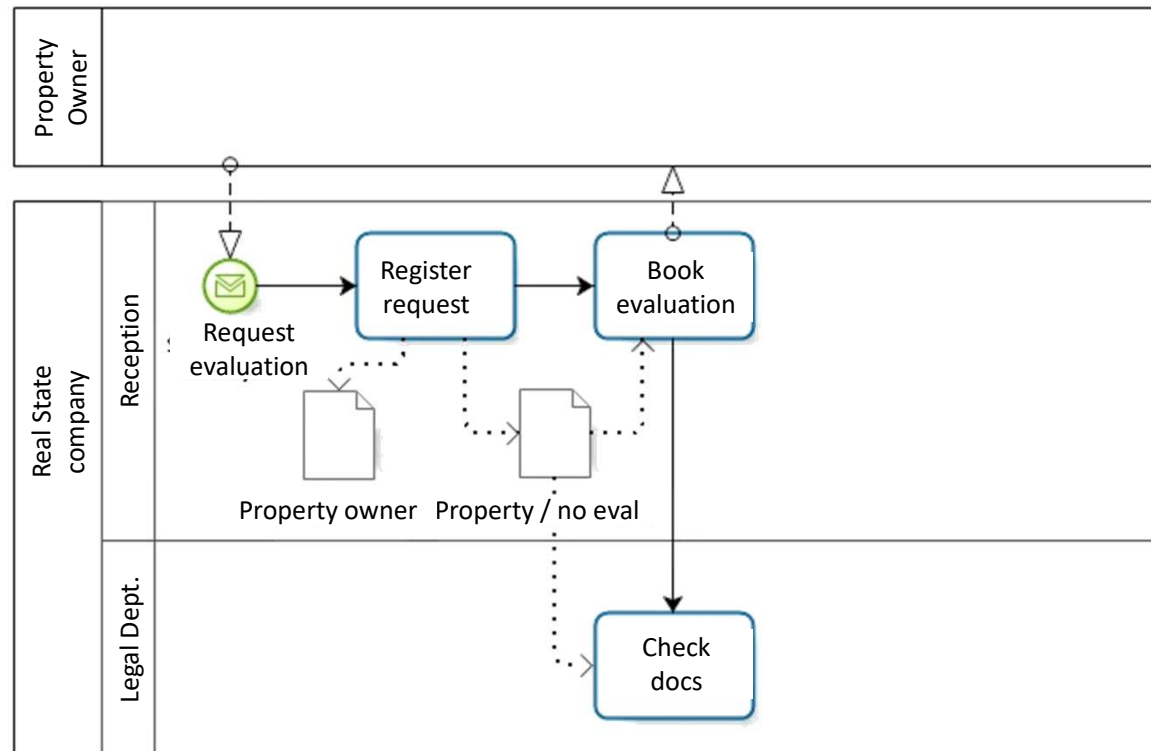
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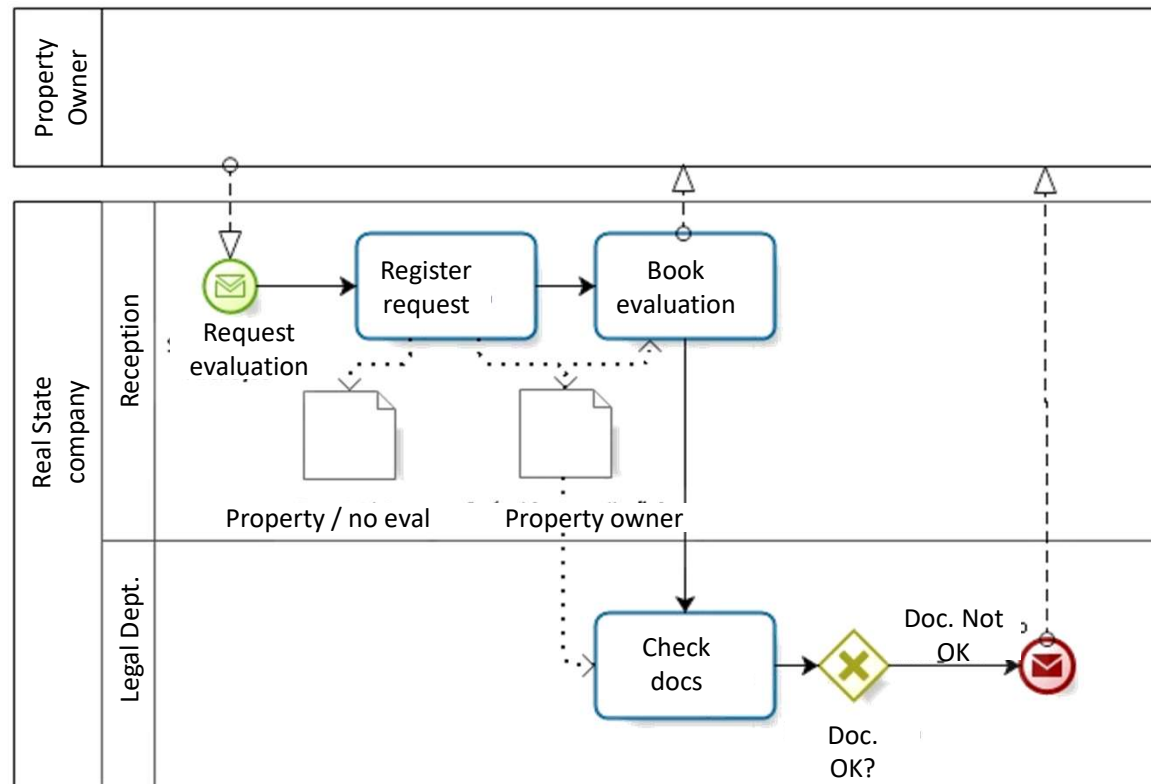
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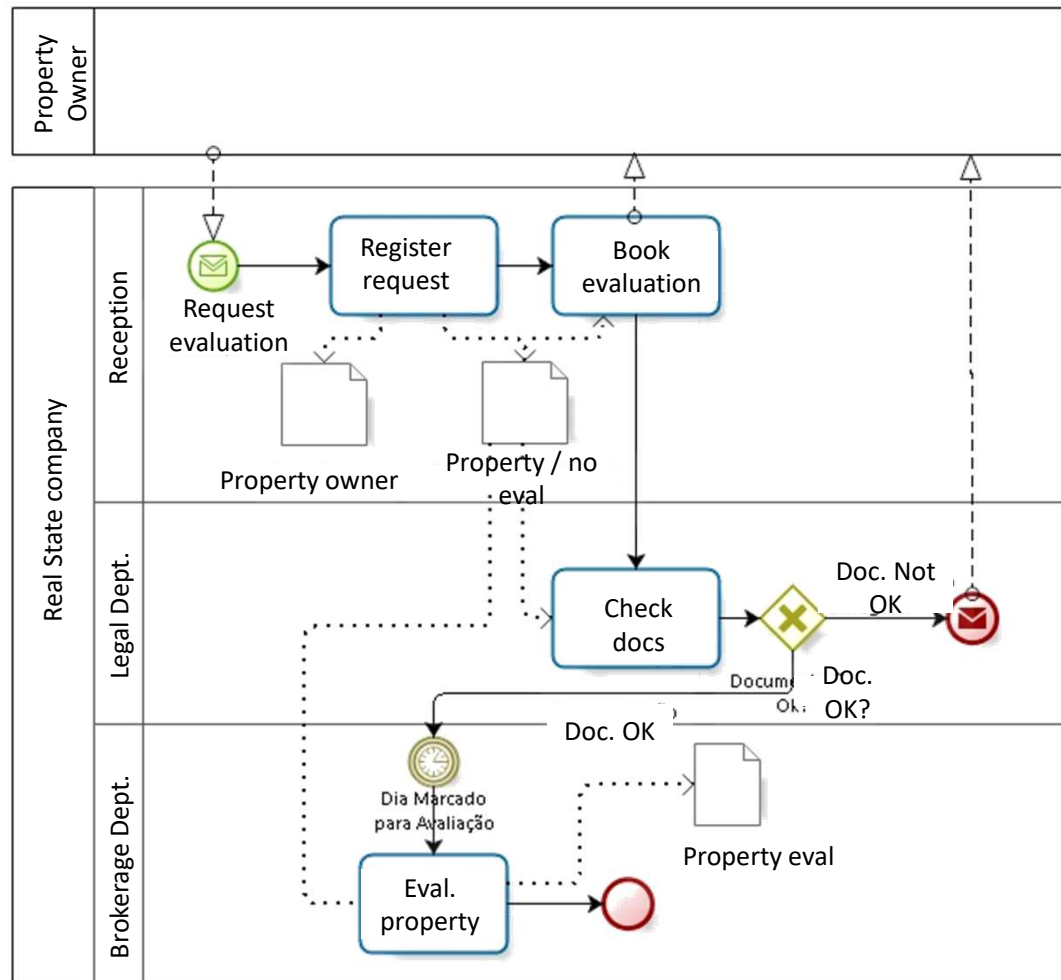
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Example- Real State

Advanced Concepts of BPMN 2.0