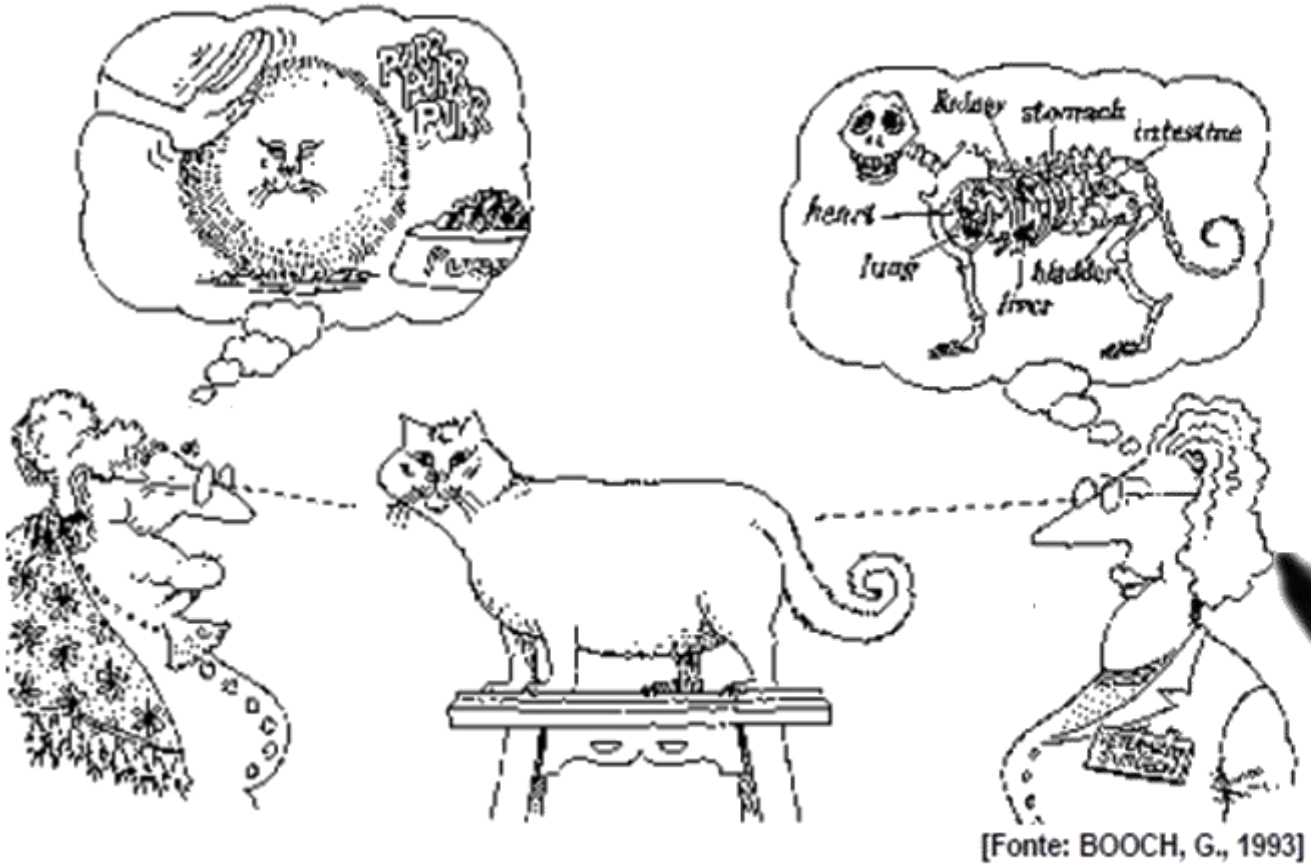
Business Process Modeling

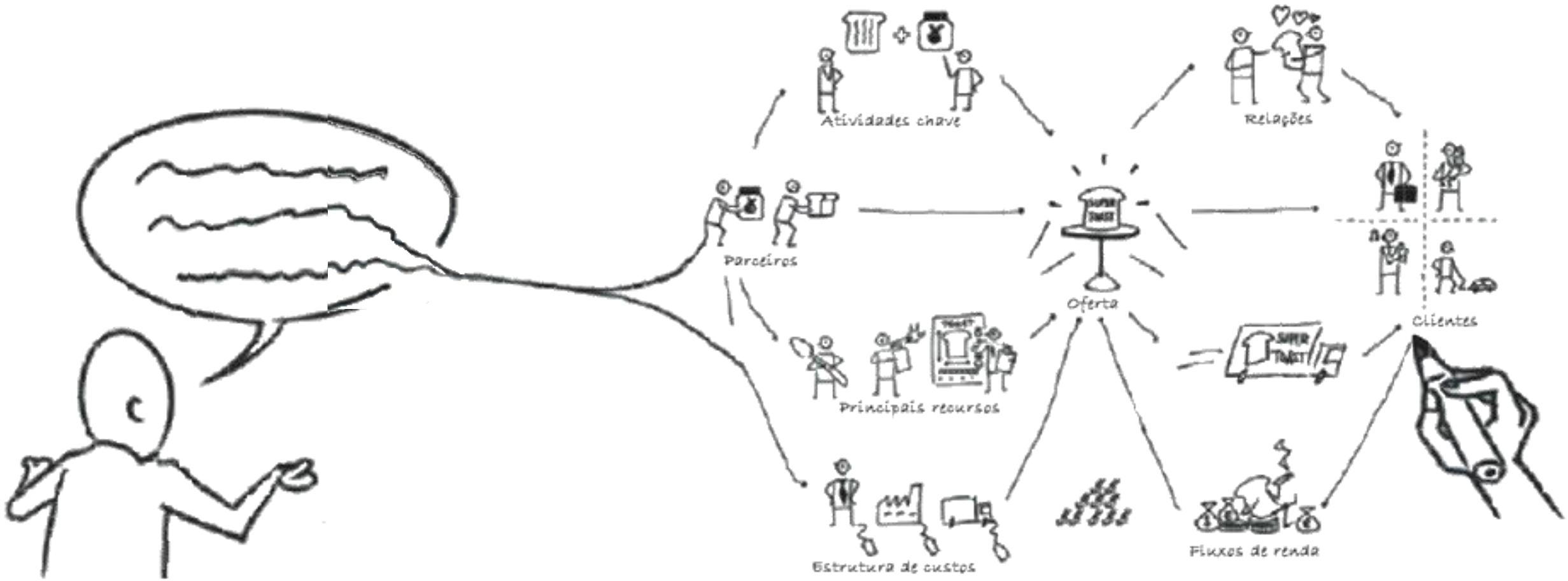
Denis Silveira/ João Araújo

ABSTRACTION



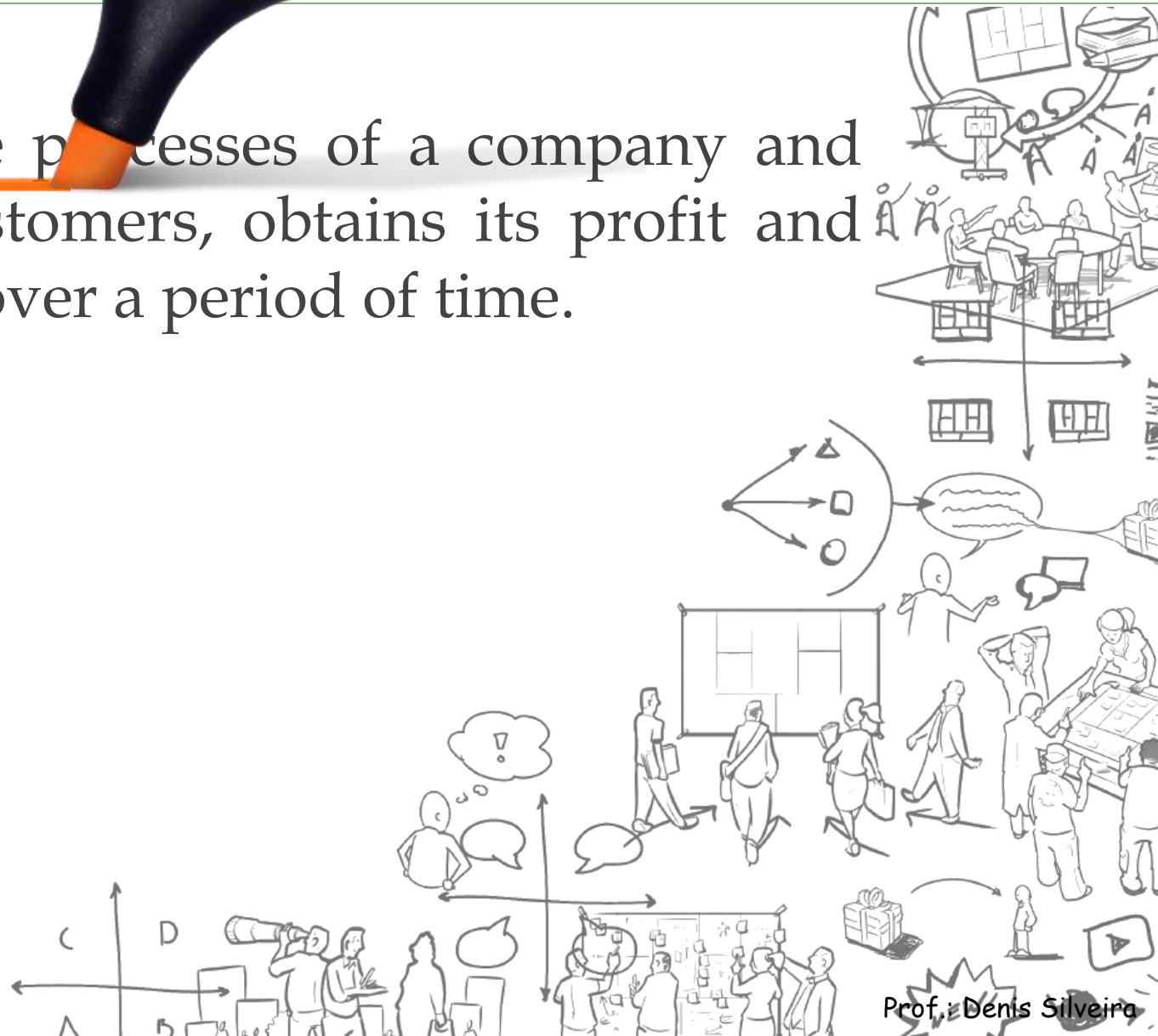
[Fonte: BOOCH, G., 1993]

MODELS HAVE SEMANTICS



MODELOS DE NEGÓCI

- 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).

– 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

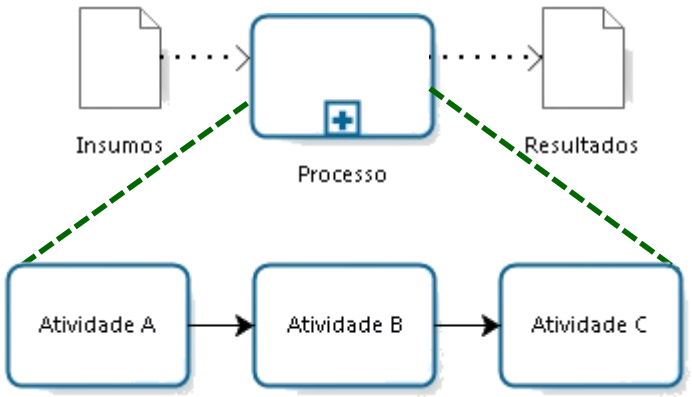
Denis S. Silveira/João Araujo
dsilveira@ufpe.br

Basic Elements

- *The Business Process Modeling Notation* – BPMN is rich in modeling elements
  - However, from 7 basic elements it is possible to do a good modeling work

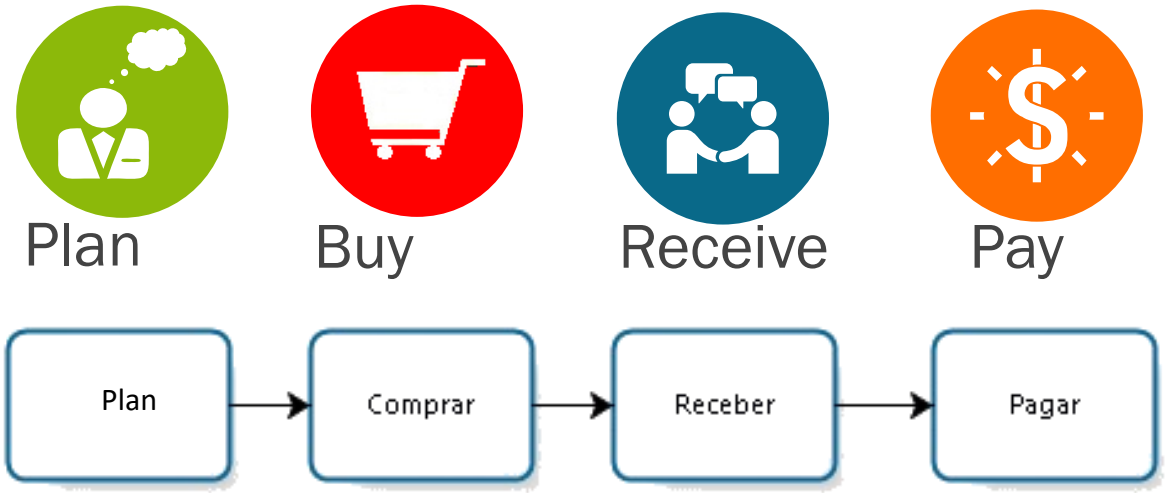
PROCESS

- It is a sequence of activities with a specific purpose.
- It exists to PROCESS inputs and then produce results..
- To transform the inputs into results is necessary to carry out a work / action.



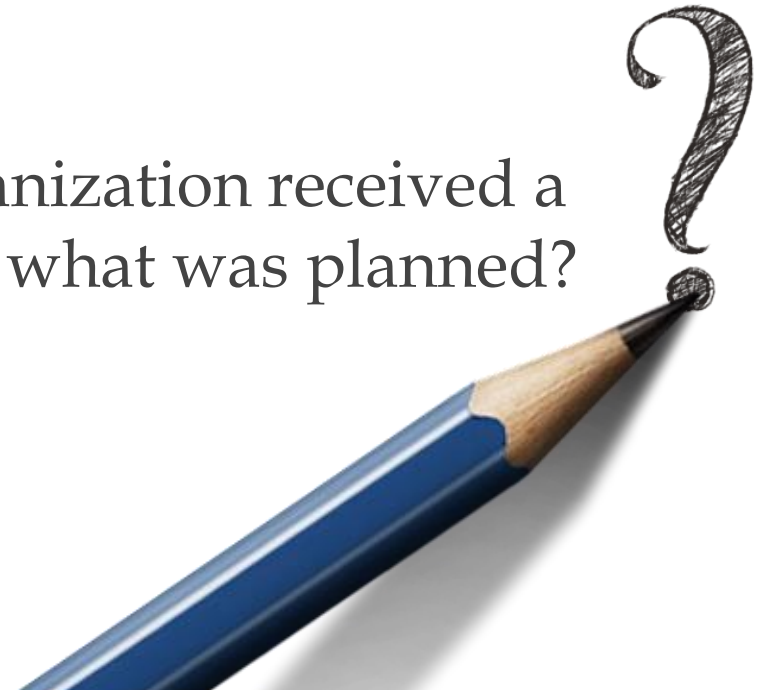
ACTIVITY

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



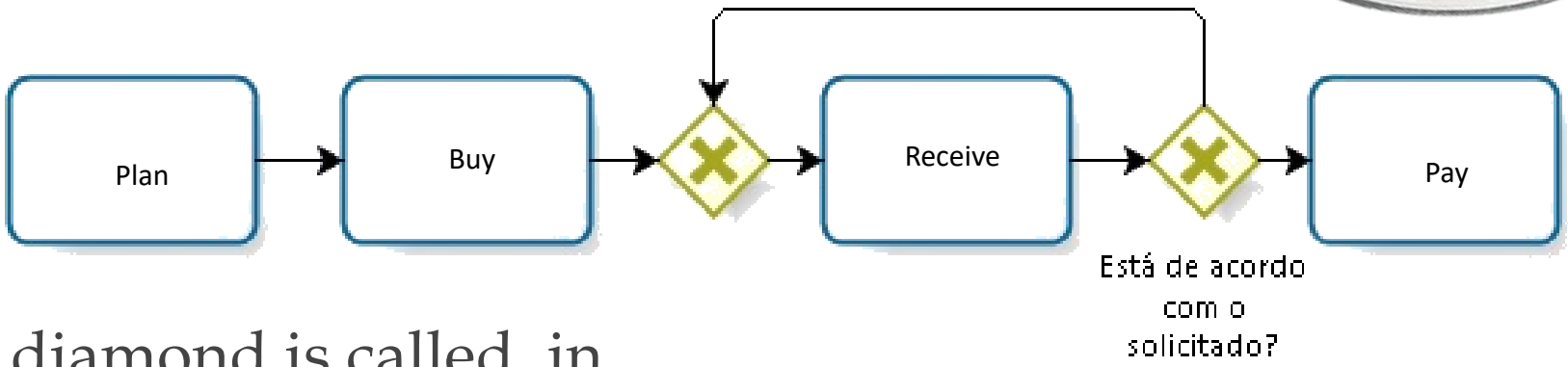
MODIFICAR O CAMINHO

- Ofen 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 na organization received a good or service different from what was planned?



MODIFY THE FLOW

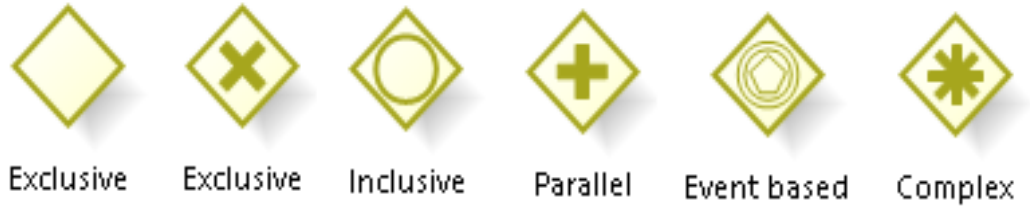
- What if the organization received a good and / service different from what was planned



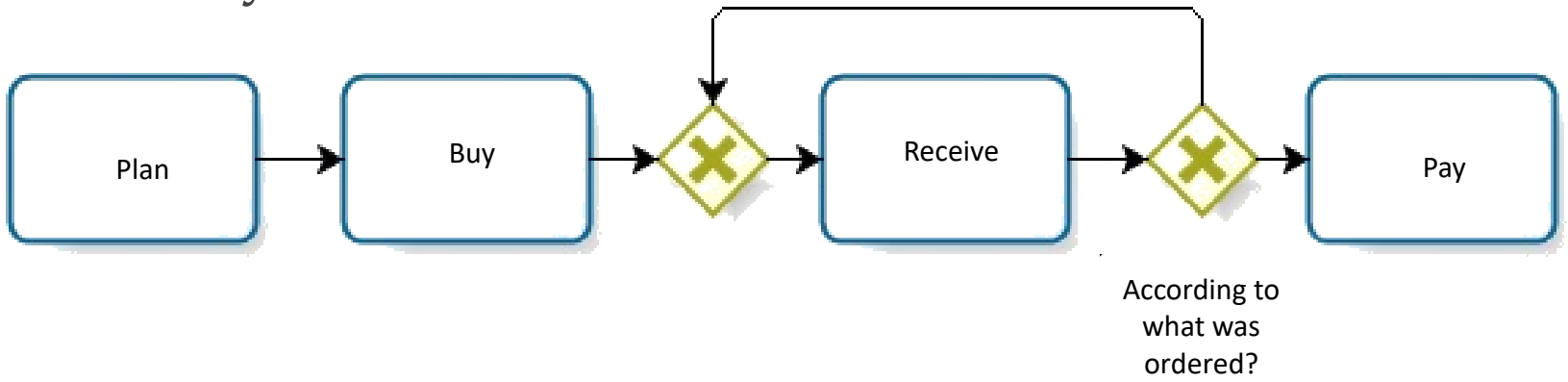
- The diamond is called, in BPMN, *gateway*

GATEWAY

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

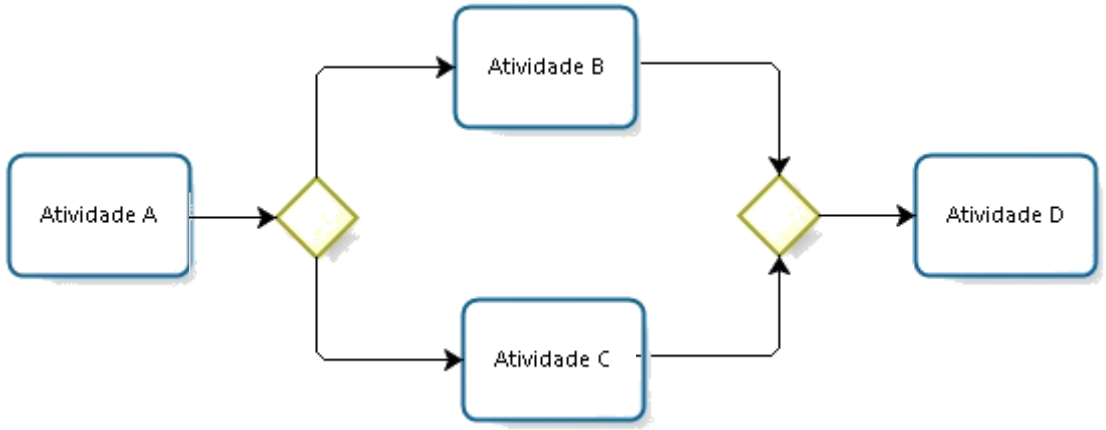


  - Good practice recommends keeping only one input and one flow output for each activity



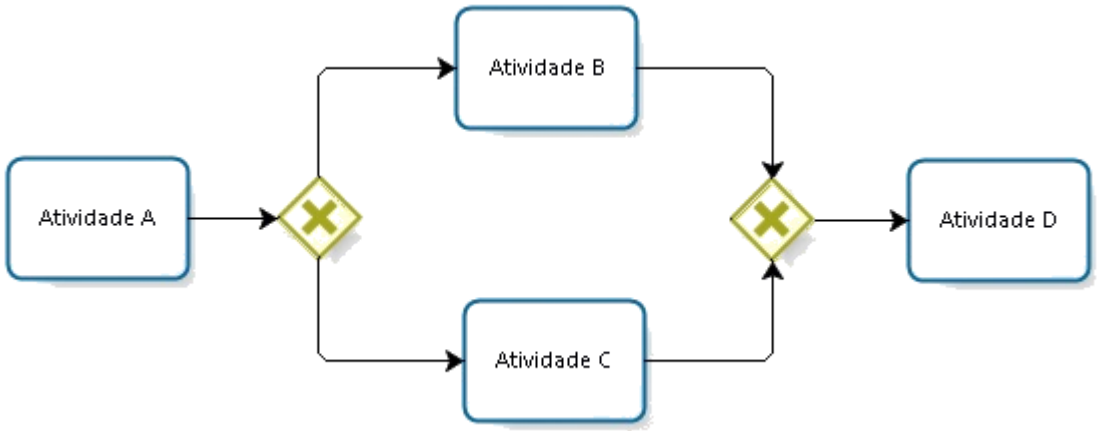
GATEWAY

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



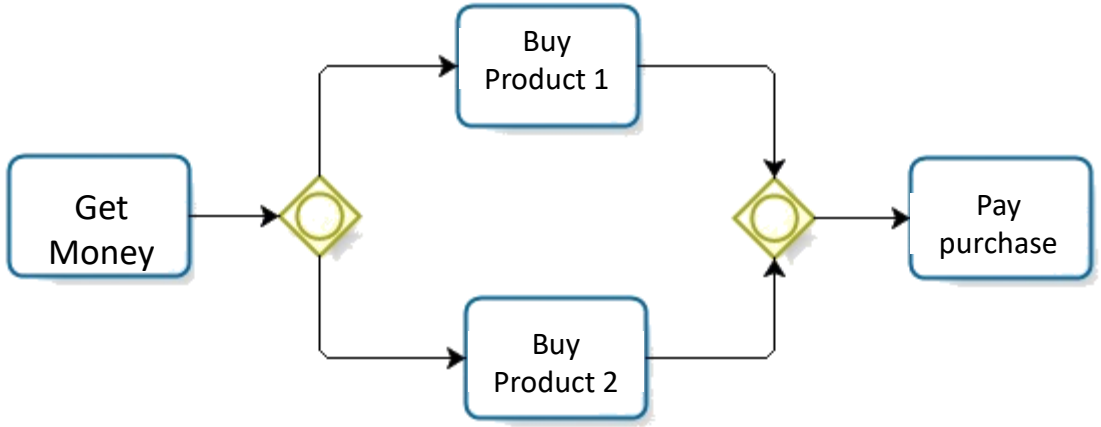
EXCLUSIVE *GATEWAY*

- The default gateway is called the default gateway.
- It can be represented by a simple diamond or with an "X" inside



INCLUSIVE *GATEWAY*

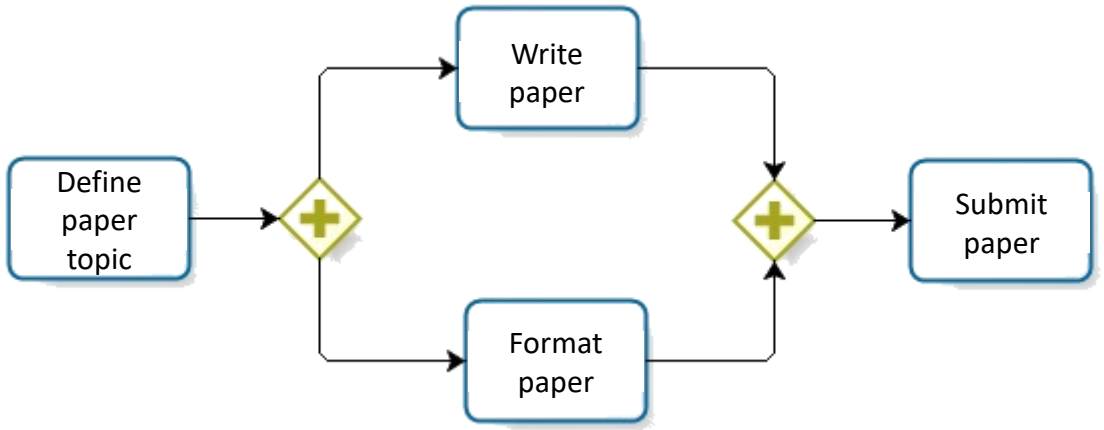
- Represented by a circle within the diamond; means taking one of the paths or both paths.



- 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.



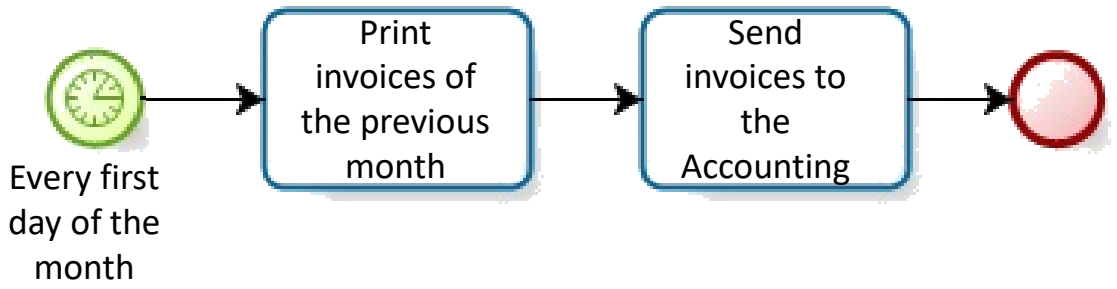
- In this case, the gateway is represented by a "+" sign inside the diamond.

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 cases.
- The events are classified, in a very general way, in:
    -  start events
    -  intermediate events
    -  end events

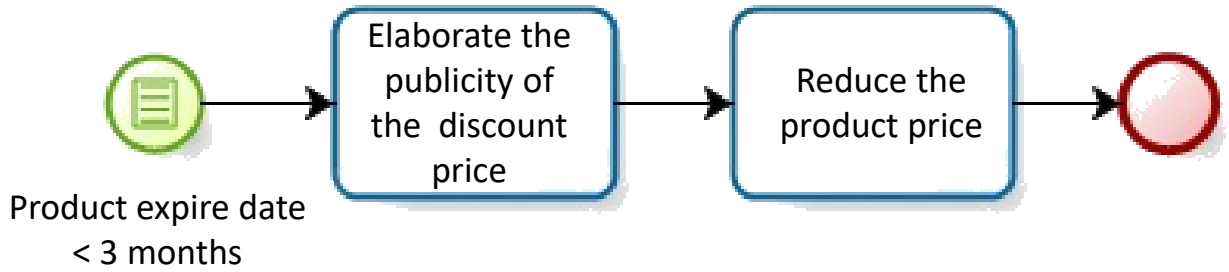
TIMER START EVENTS

- A process can be initiated by a time event
- Something that happens every time period or on a specific date
- The event is described a clock in the center of the circle and a simple line



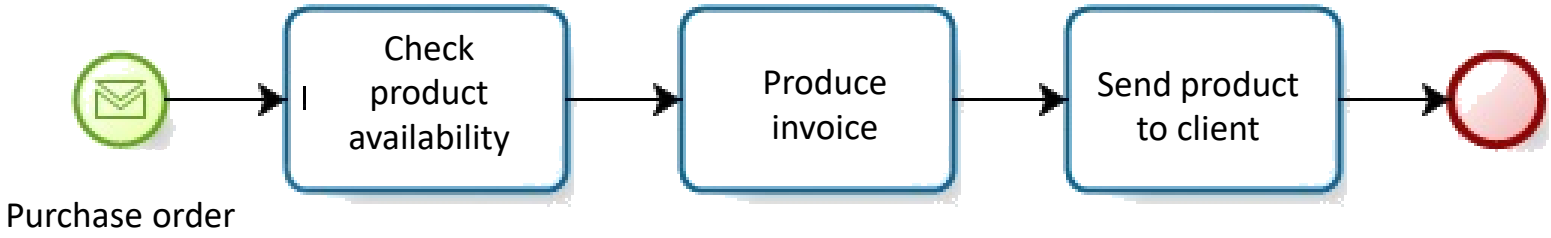
Conditional Start Events

- 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



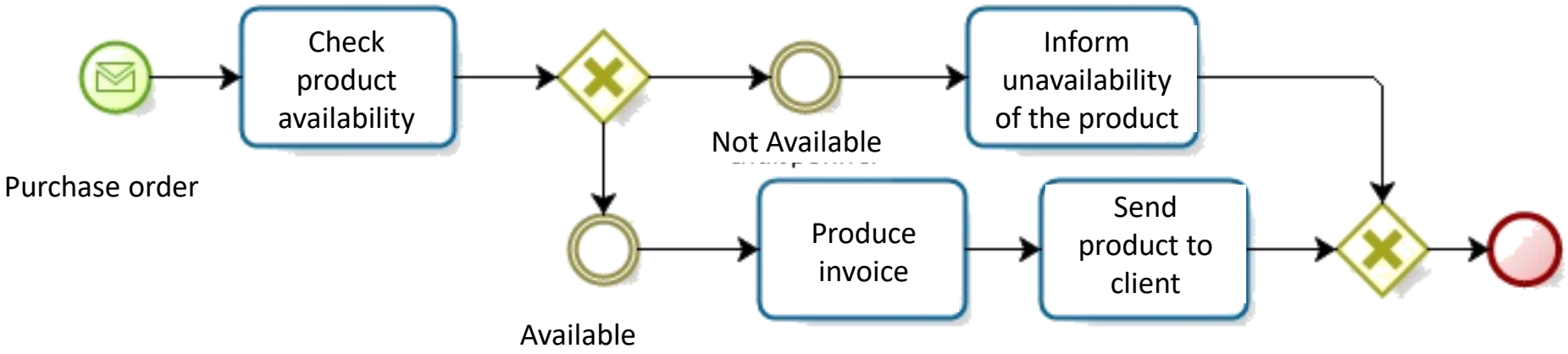
Message Start Events

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



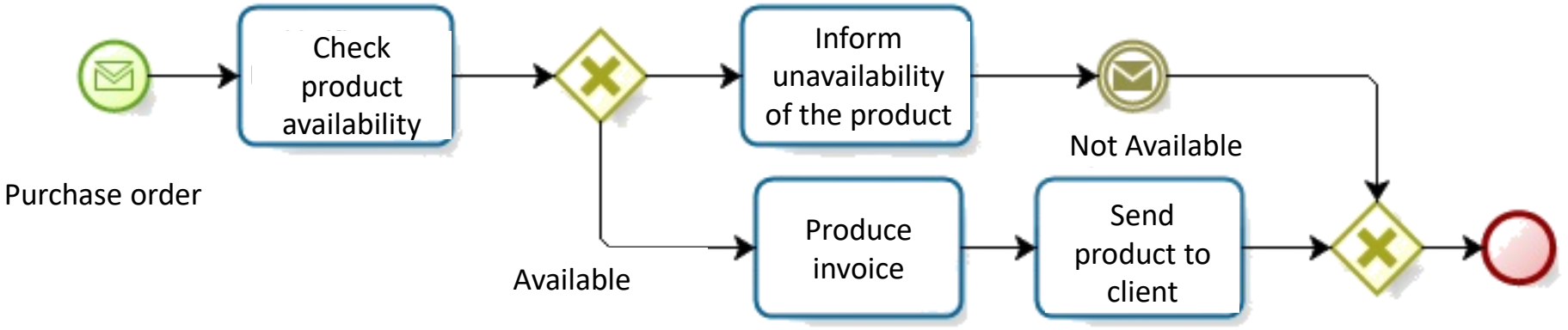
Intermediate Events

- Pattern events that have no associated semantics (drawing inside).
- They represent the simple events that occur in a process, such as the indication of availability or unavailability of a requested product, for example.



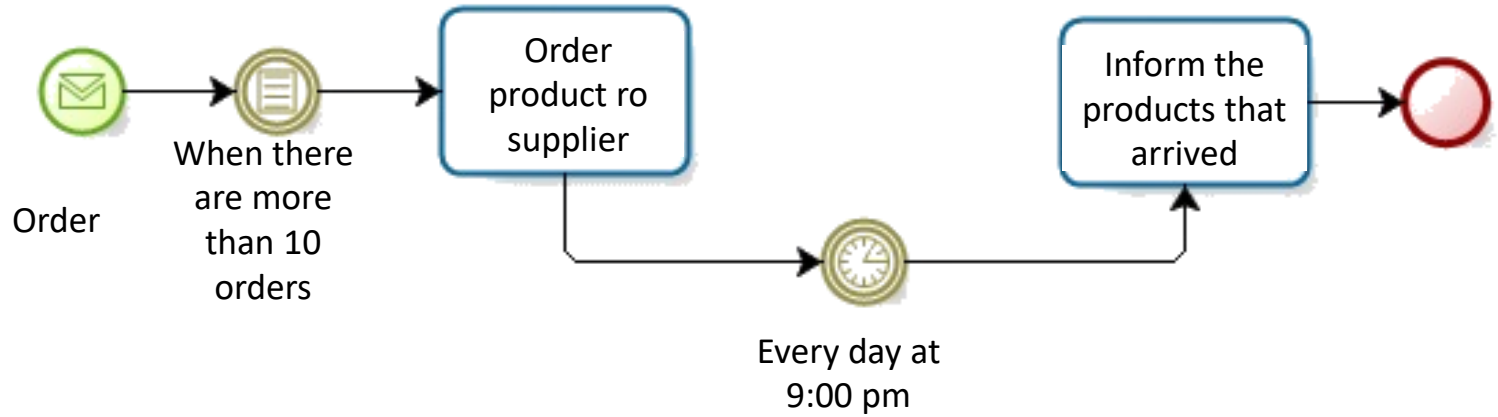
Intermediate Events

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



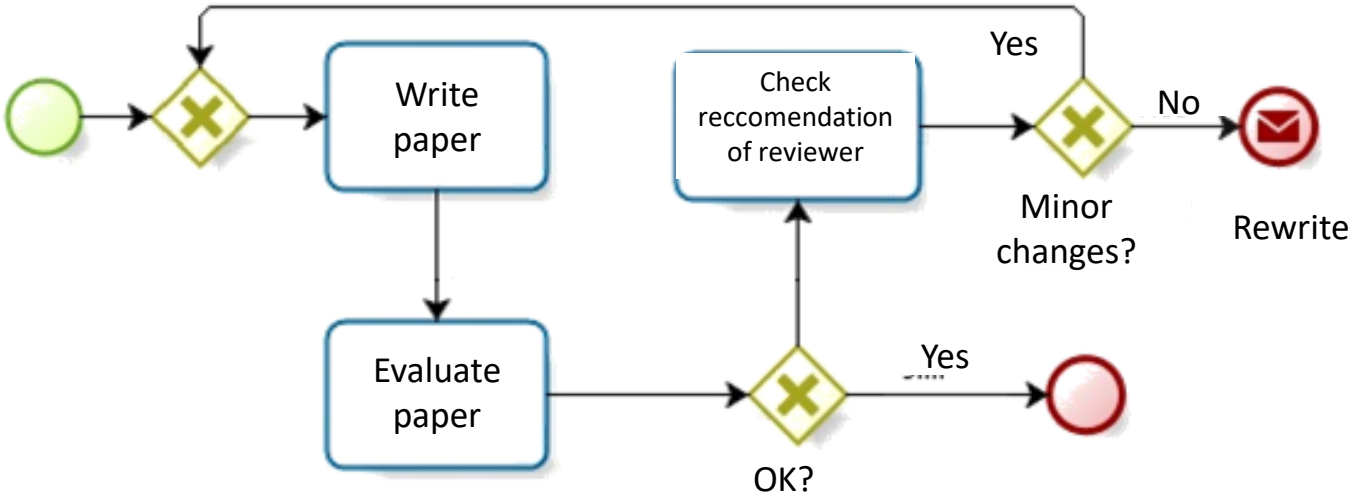
EVENTOS INTERMEDIÁRIOS

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



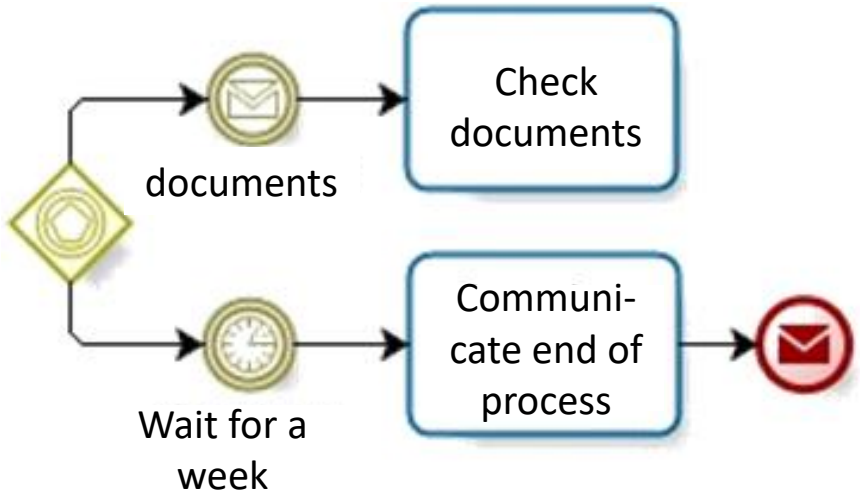
End Event

- The standard final event is represented as an empty circle with a thicker line.
- But just like the previous ones (start and intermediate), the 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

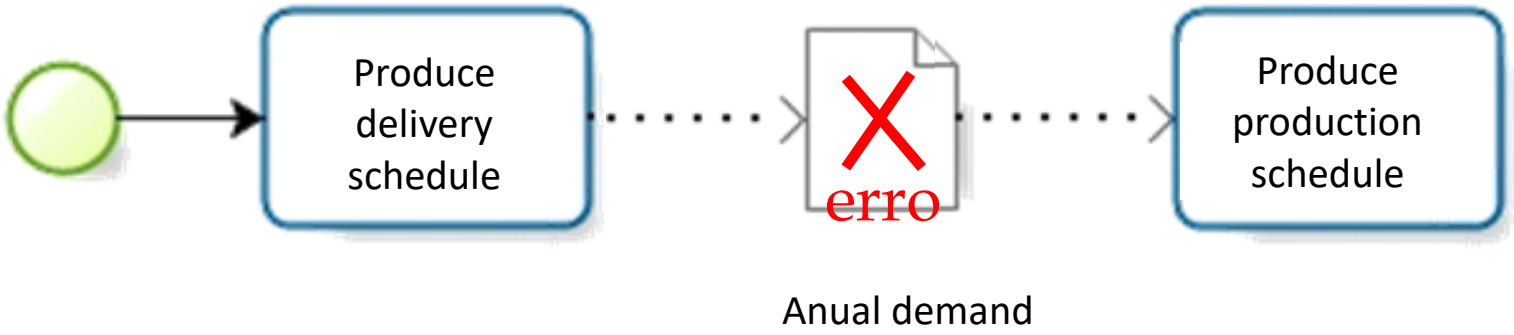


Data Objects

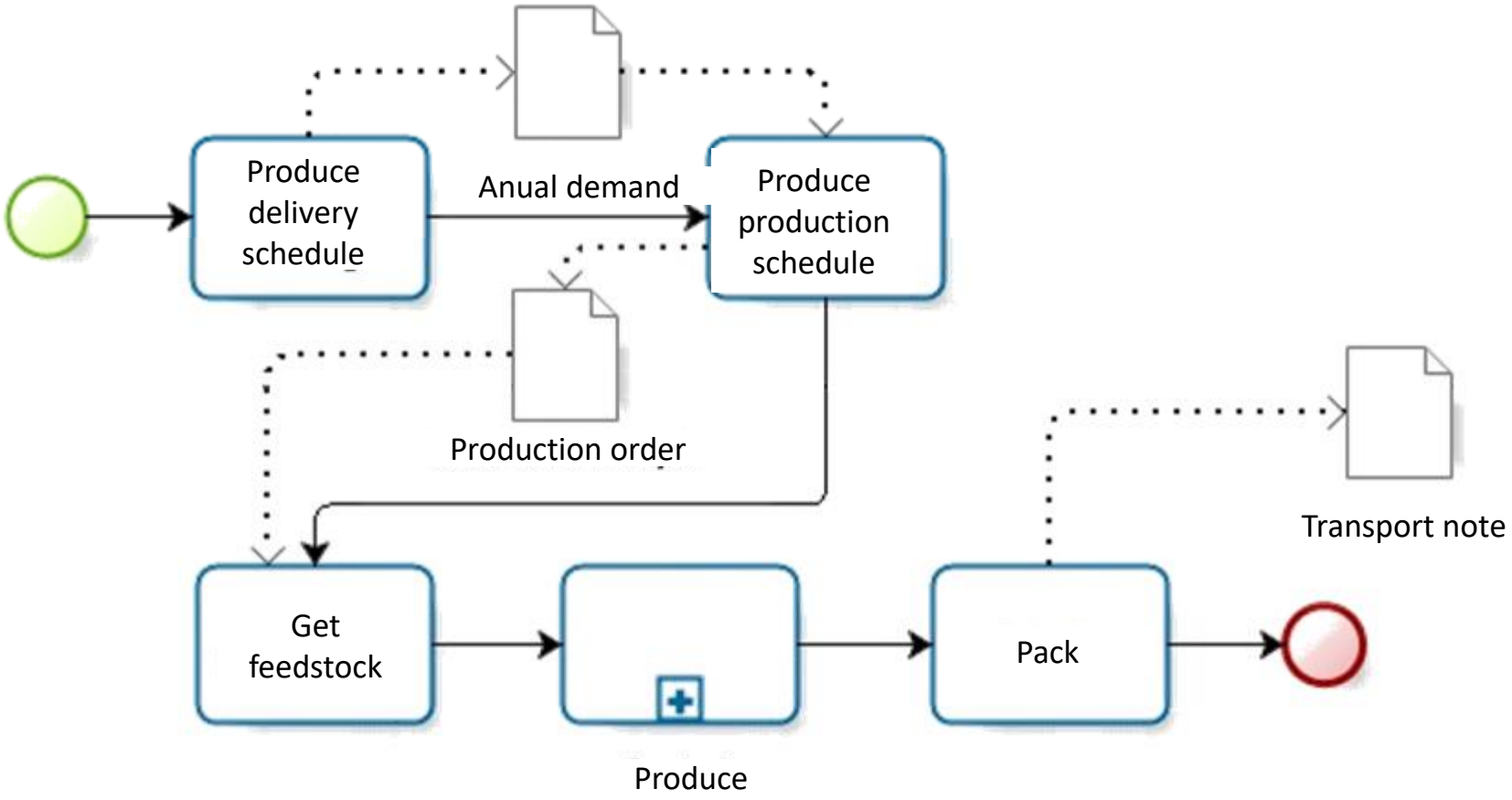
- The link between two activities occurs through the transmission of data / information, since the responses (information) produced in one activity can be consumed in another activity.
- Data and information are elements that unify all activities in a process
- In BPMN we call them *Data Object*.

DATA OBJECT

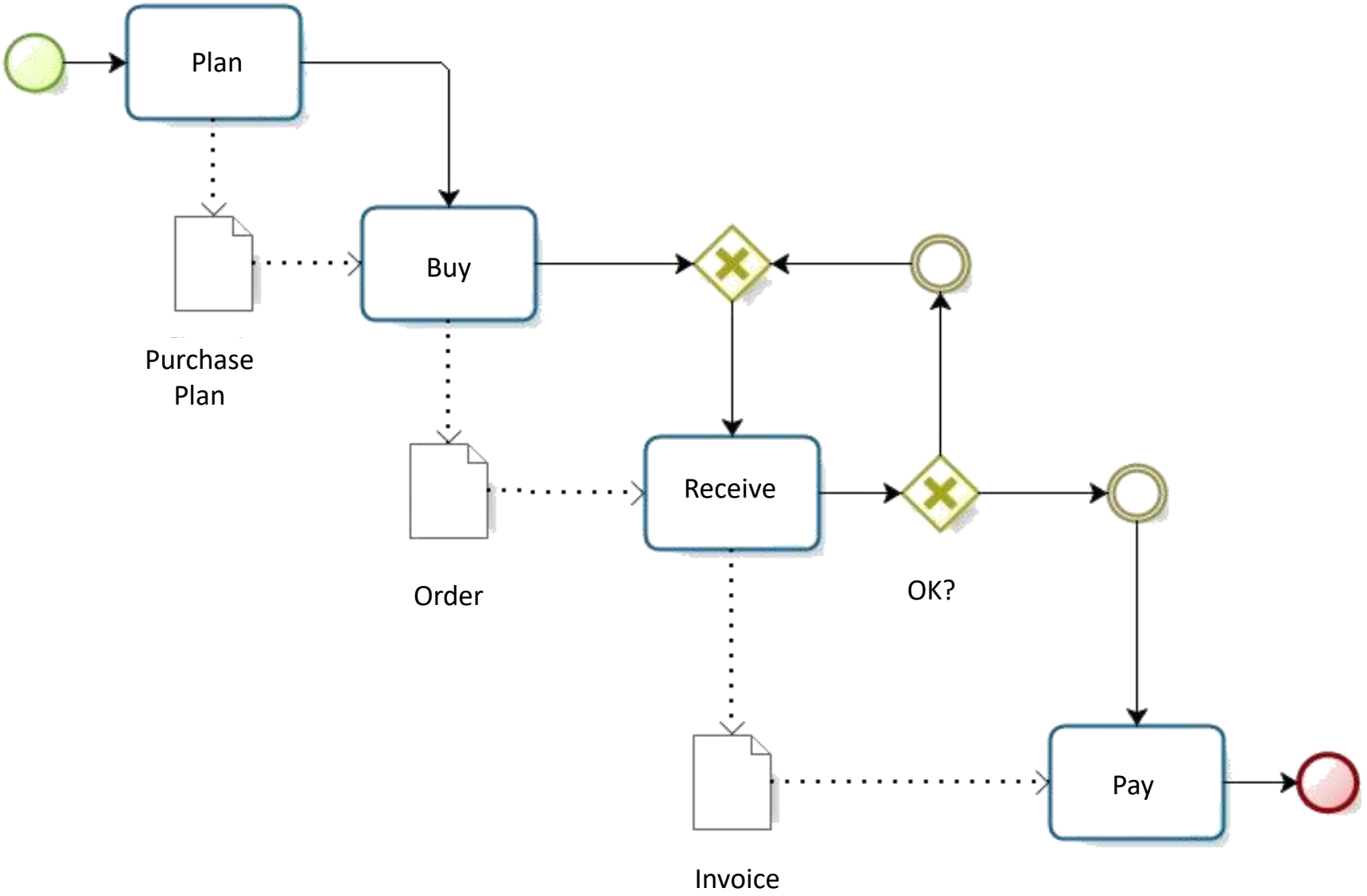

Activity
Input data
Output data


Produce delivery schedule
erro
Produce production schedule
Anual demand

DATA OBJECT


Produce delivery schedule
Anual demand
Produce production schedule
Production order
Transport note
Get feedstock
Pack
Produce

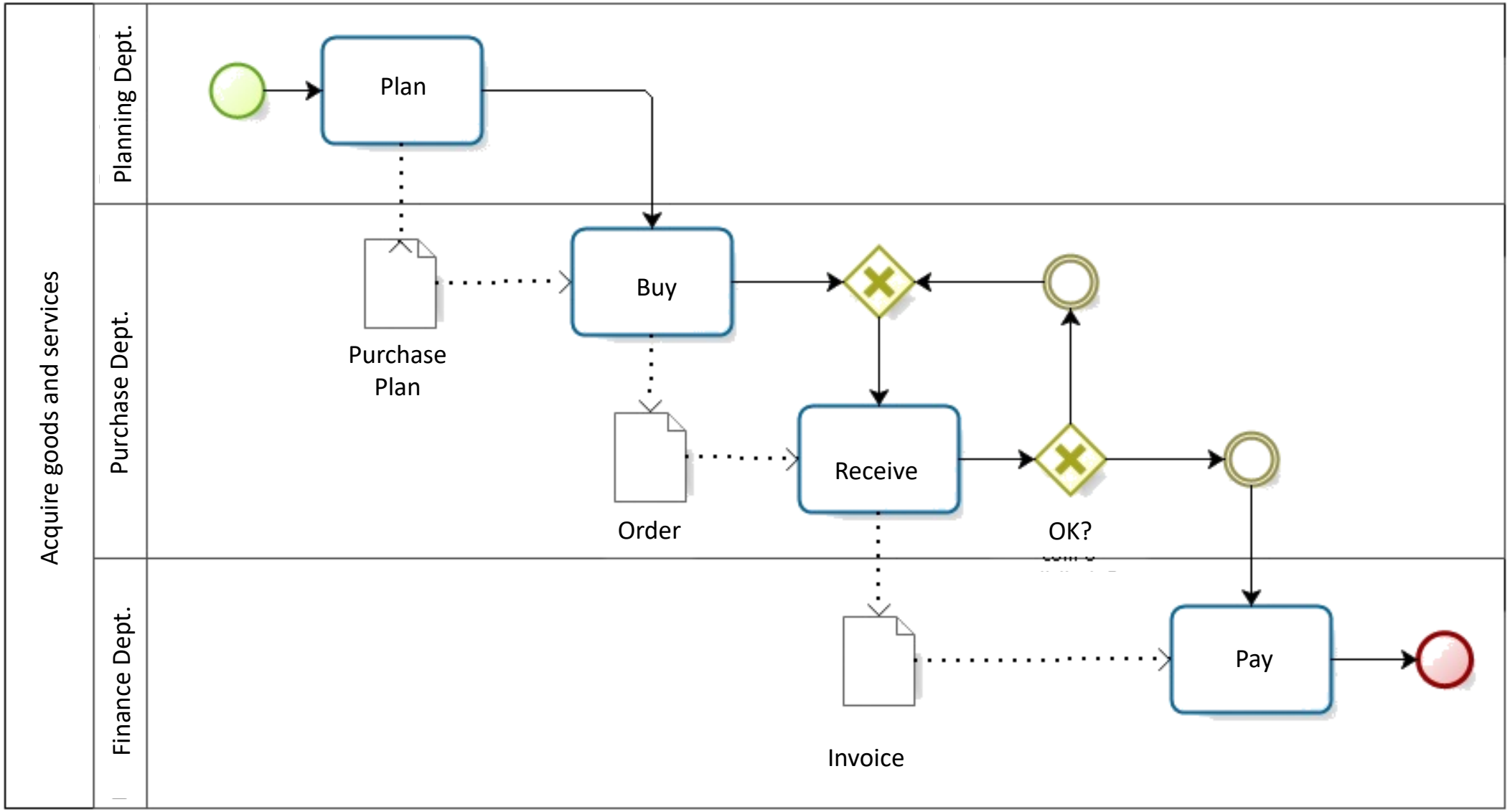
DATA OBJECT



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

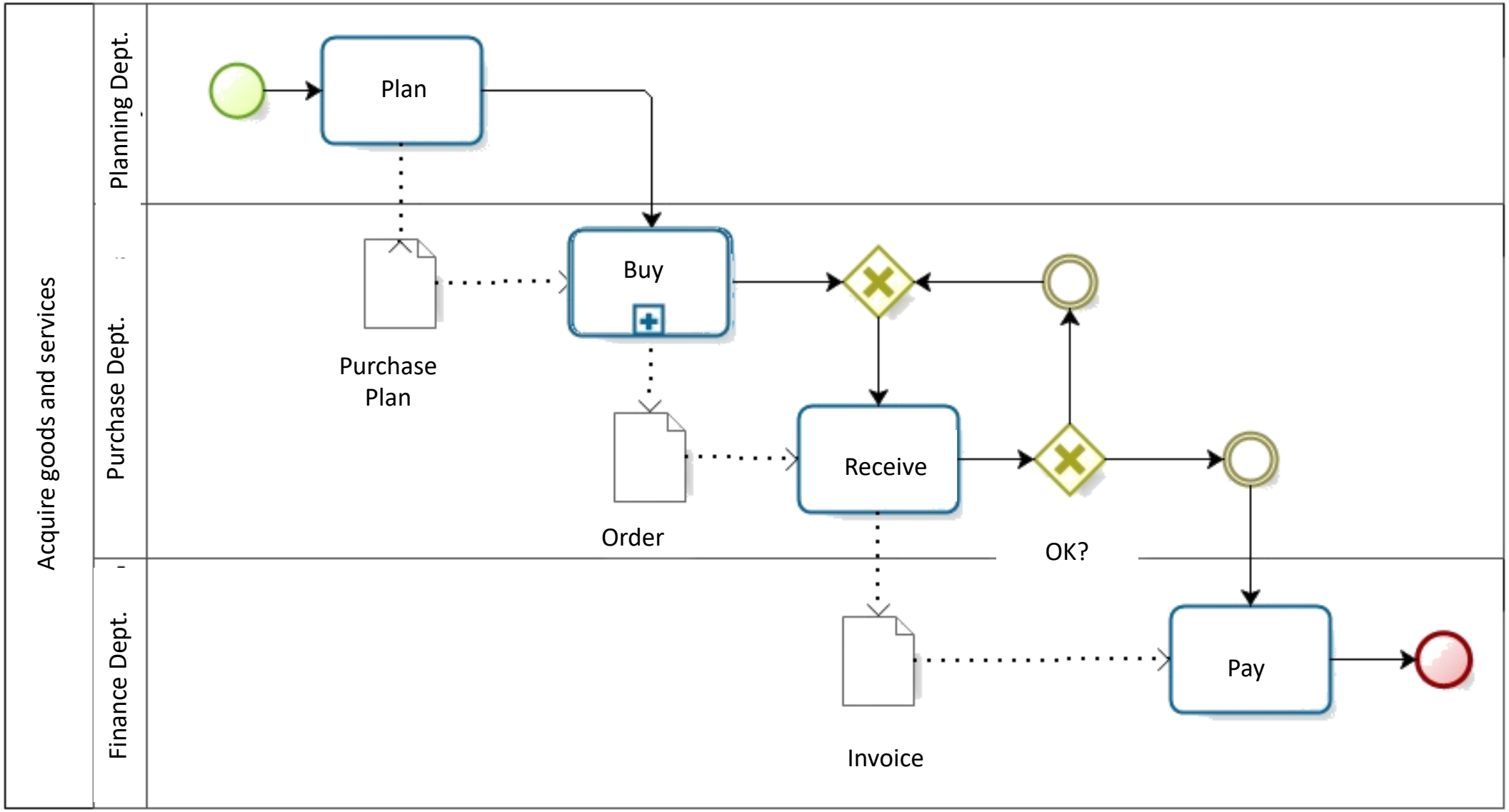
Pools and lanes



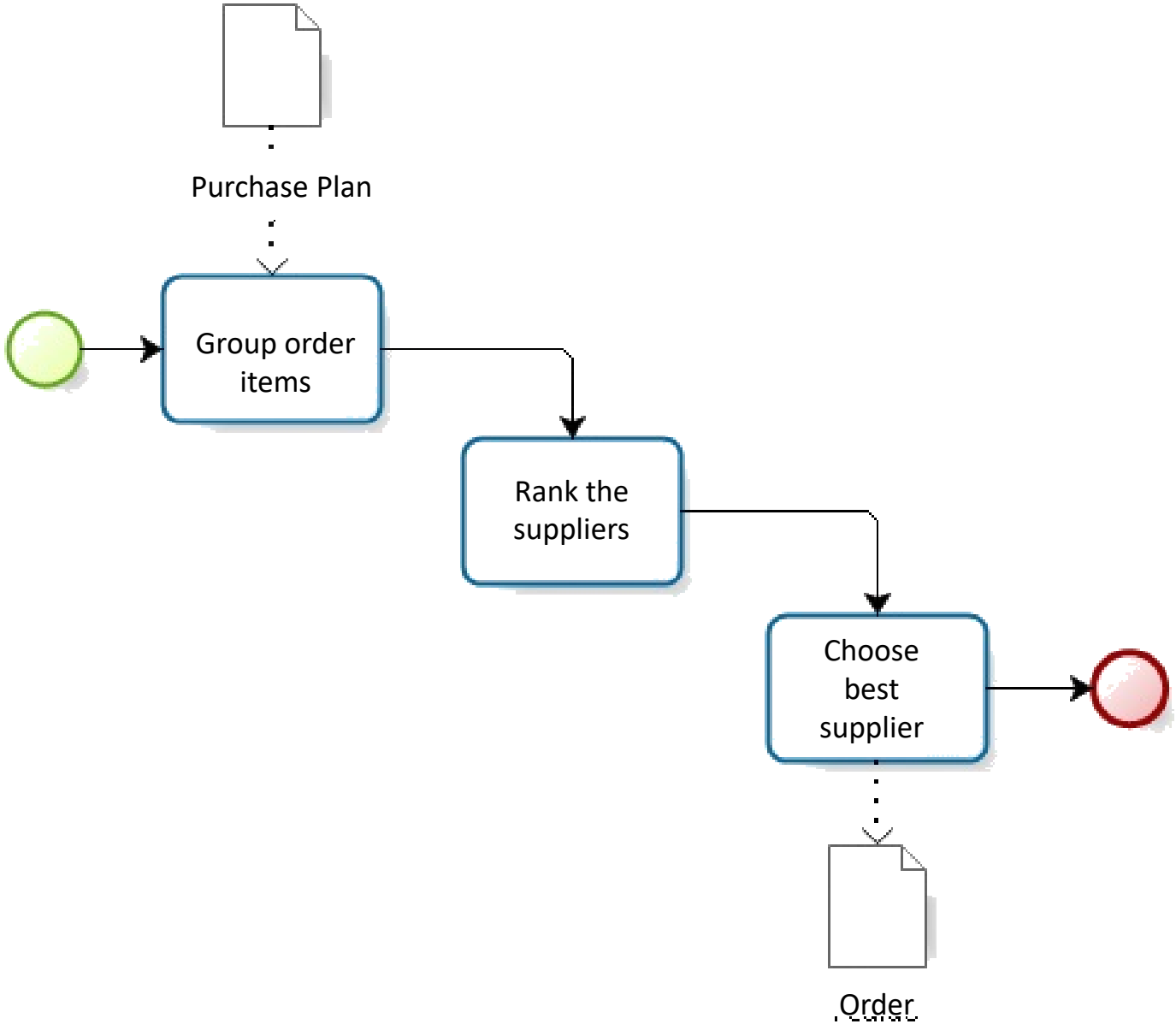
ATIVIDADE OU PROCESSO

- 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

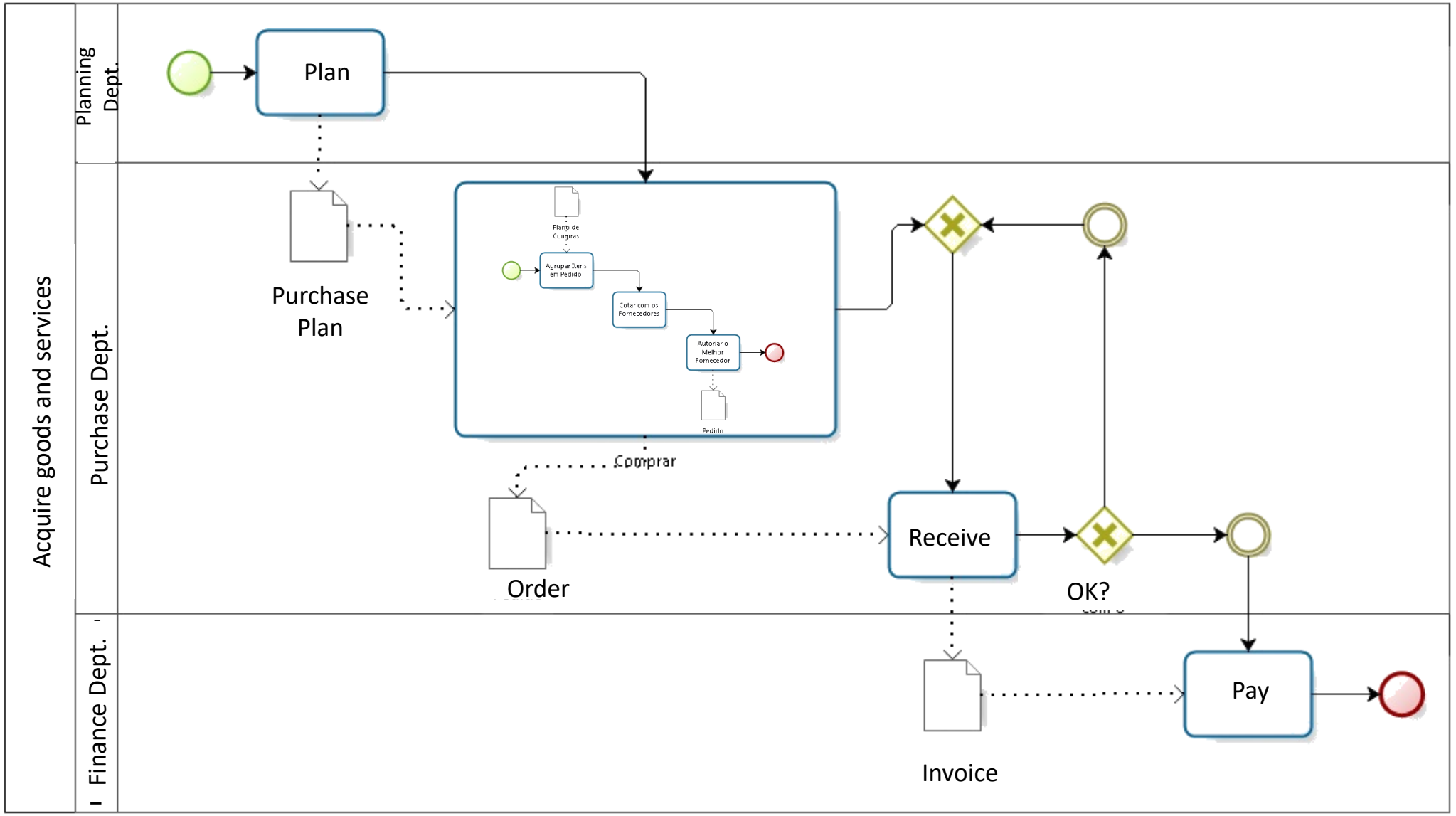
Activity or Process



Activity or Process



Activity or Process



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

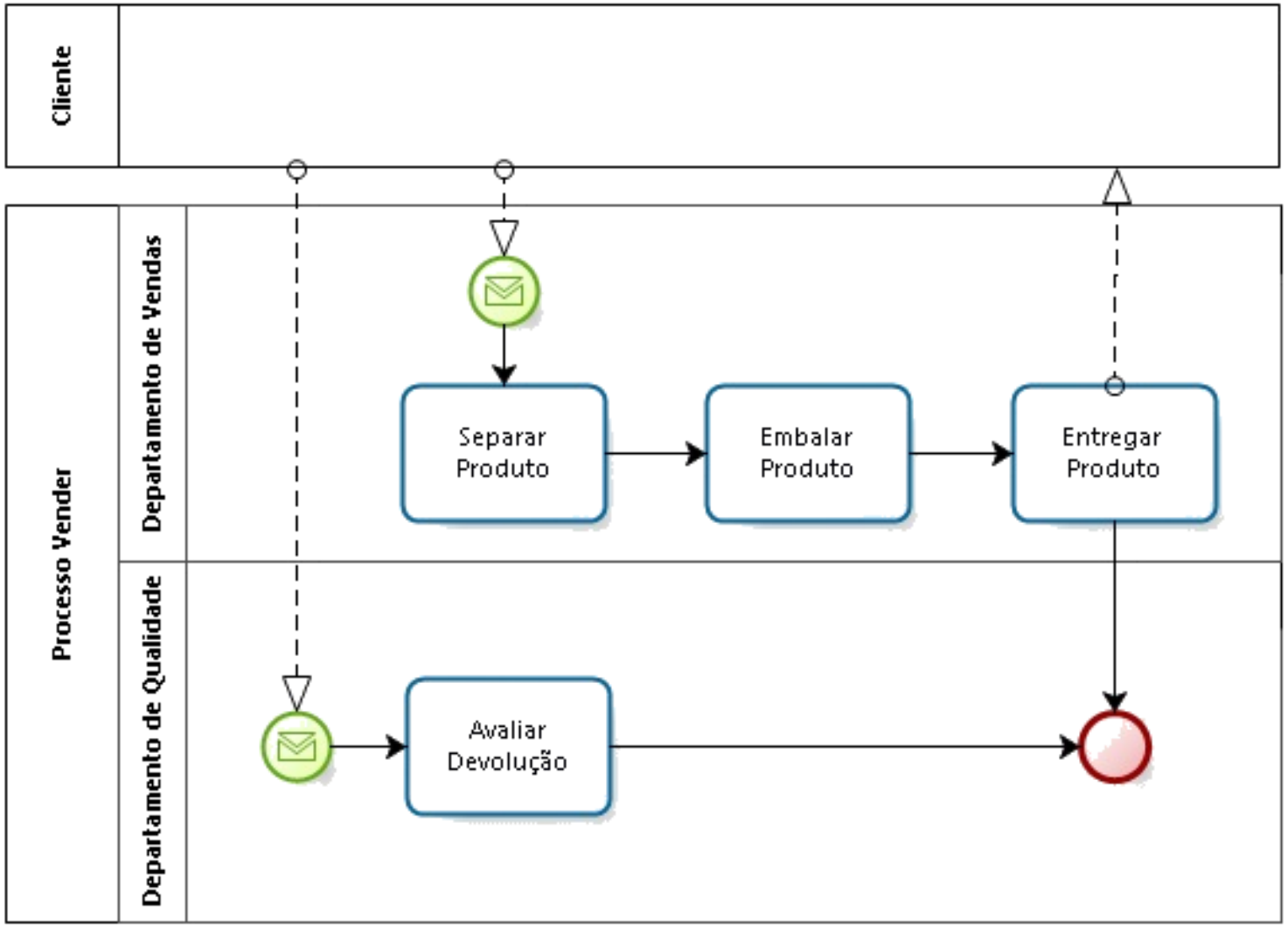
Information between processes

- 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



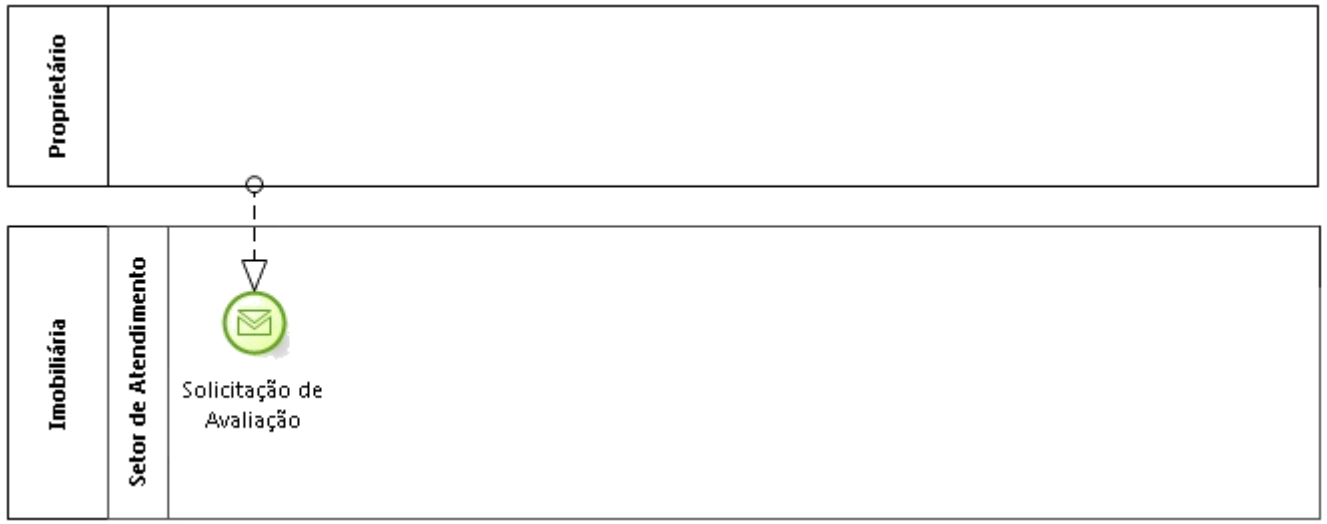
Messages

- Message exchange is a key element in resolving perspective 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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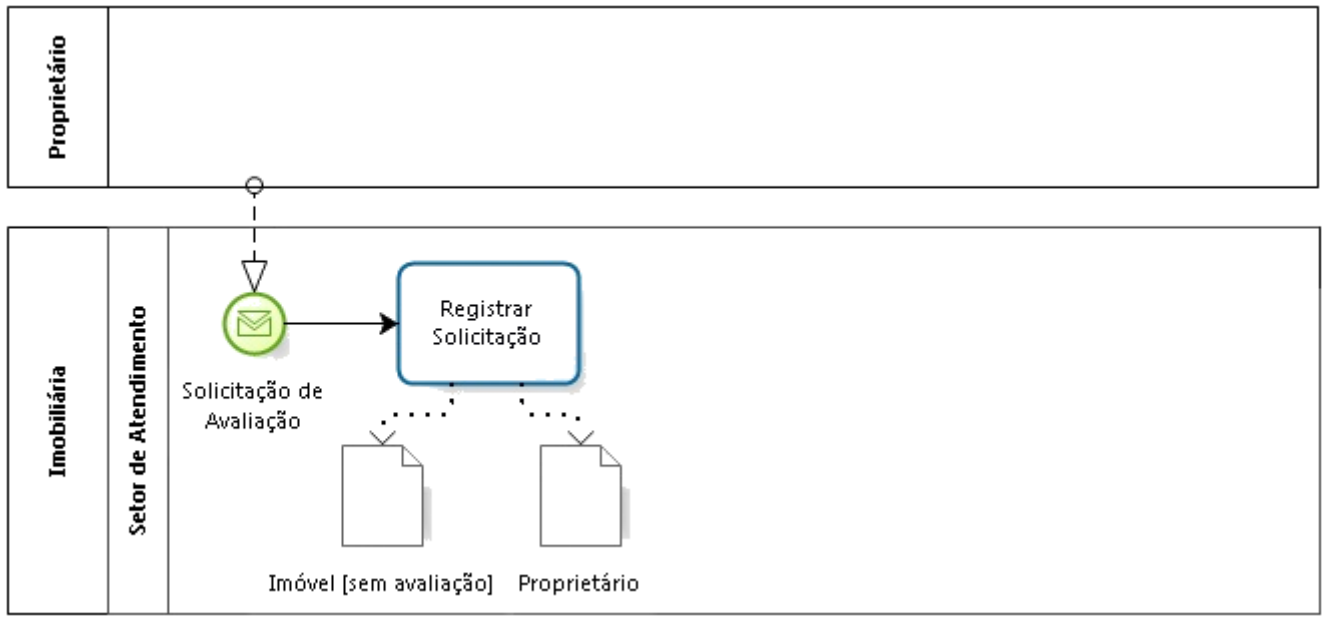

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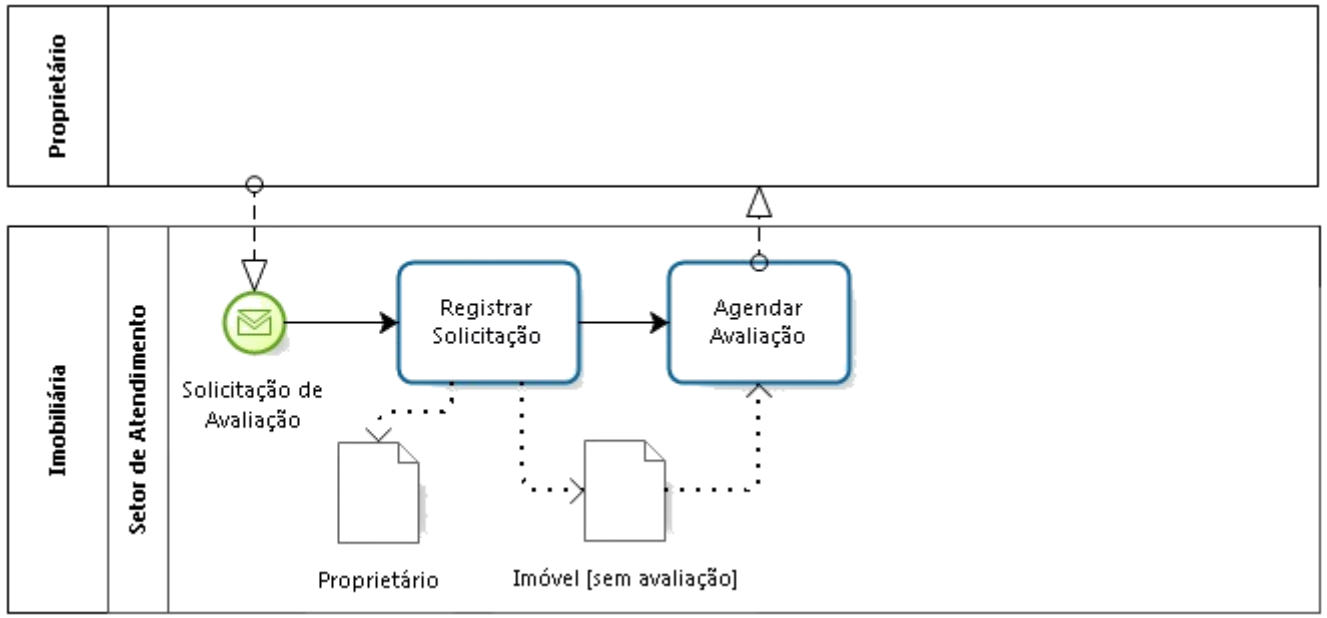

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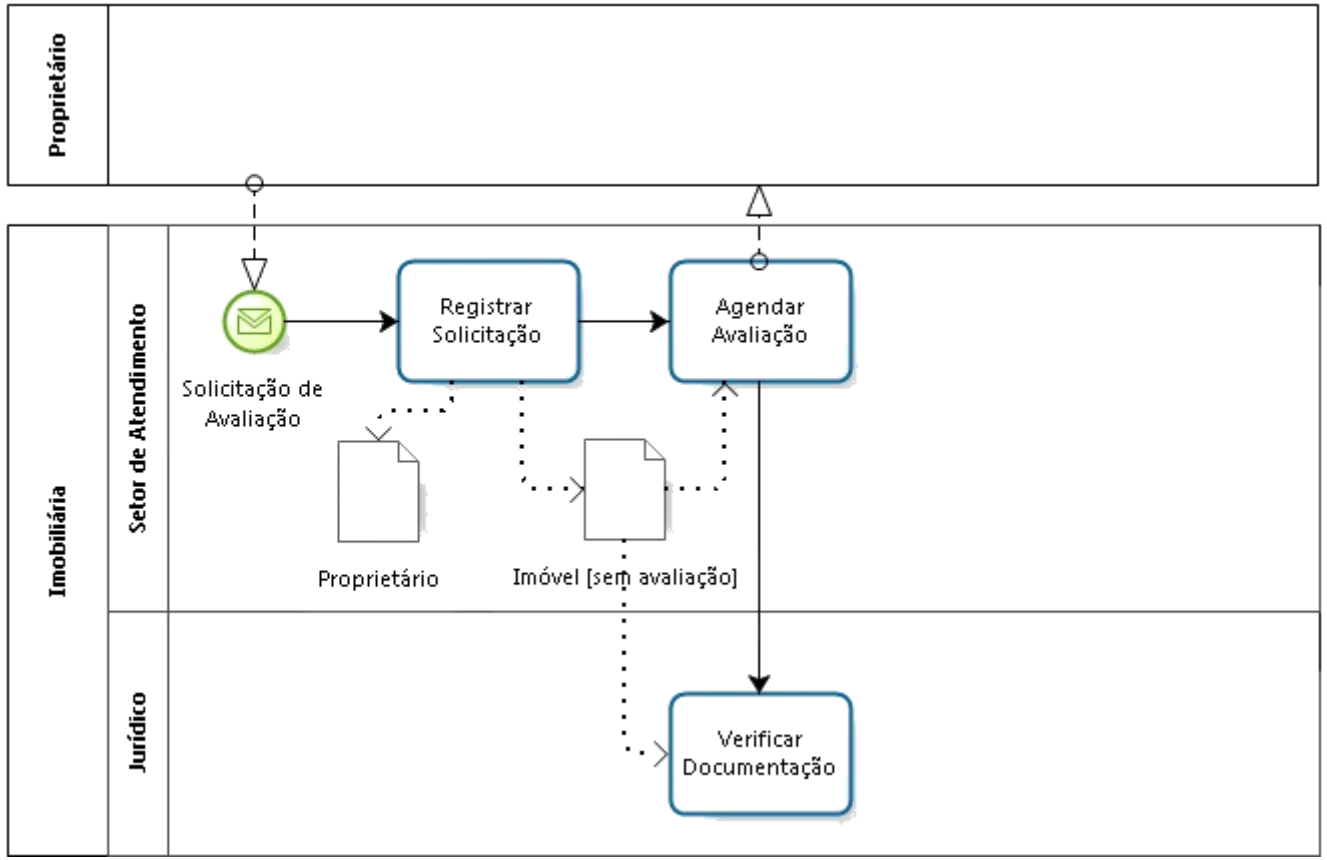

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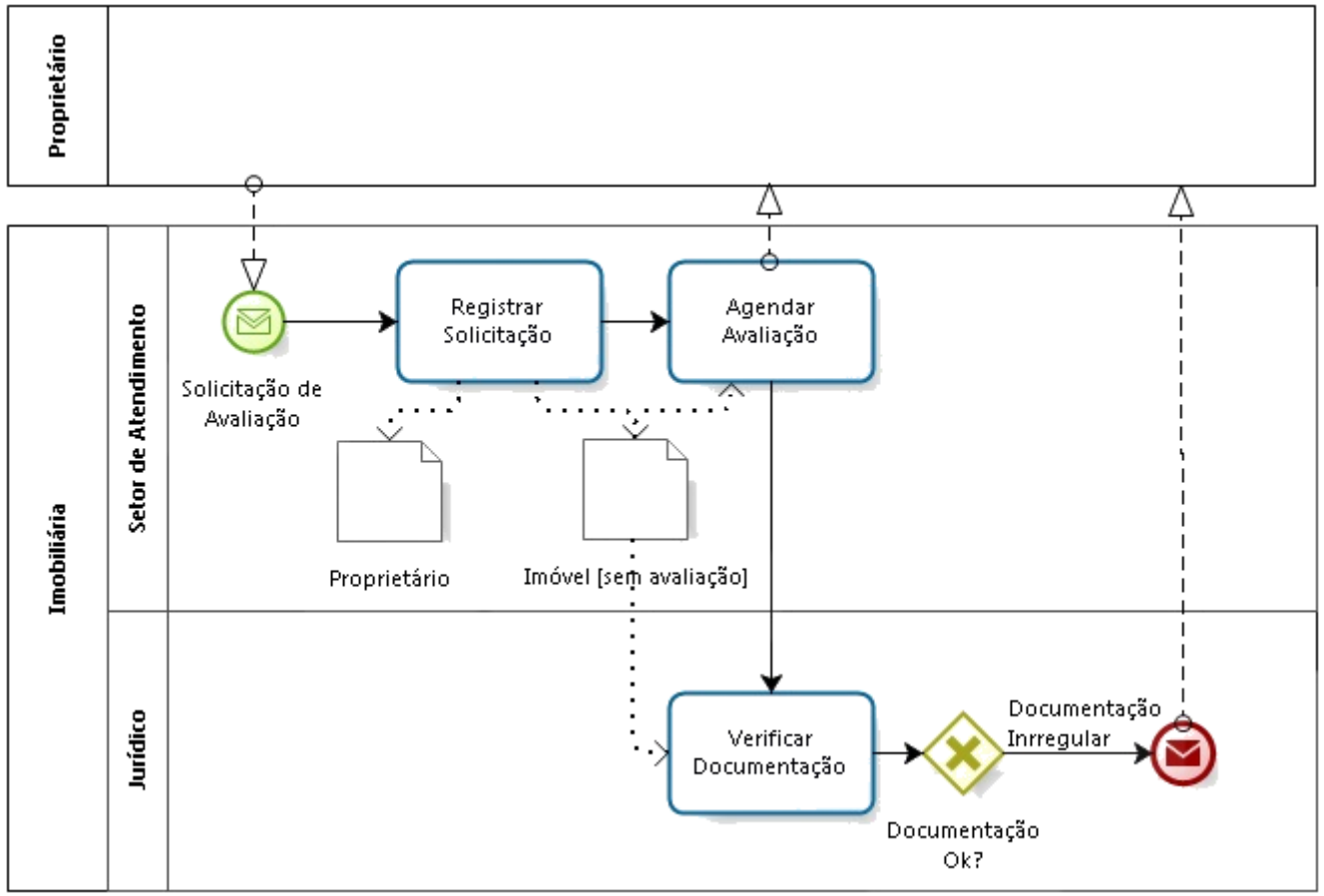

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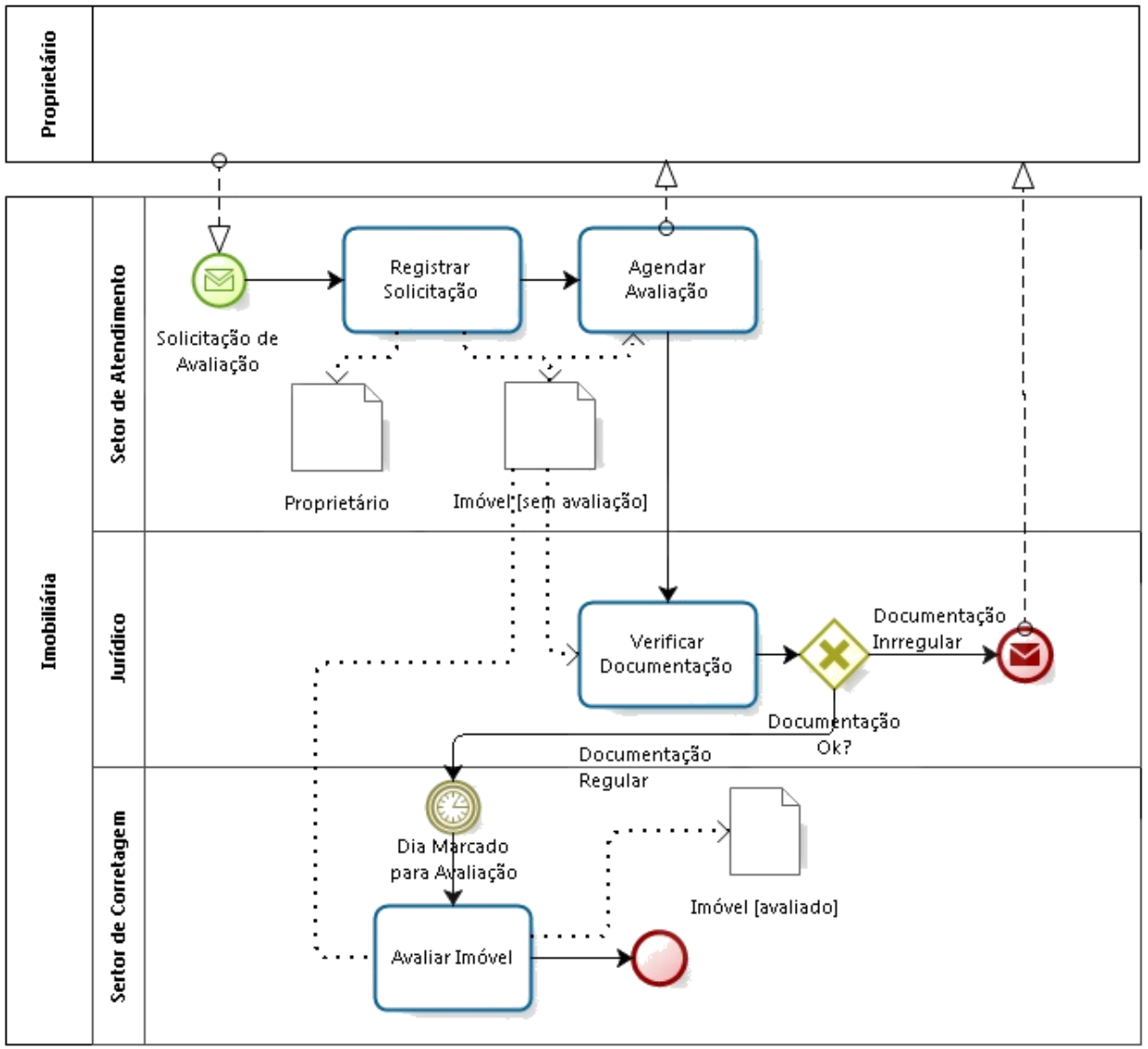
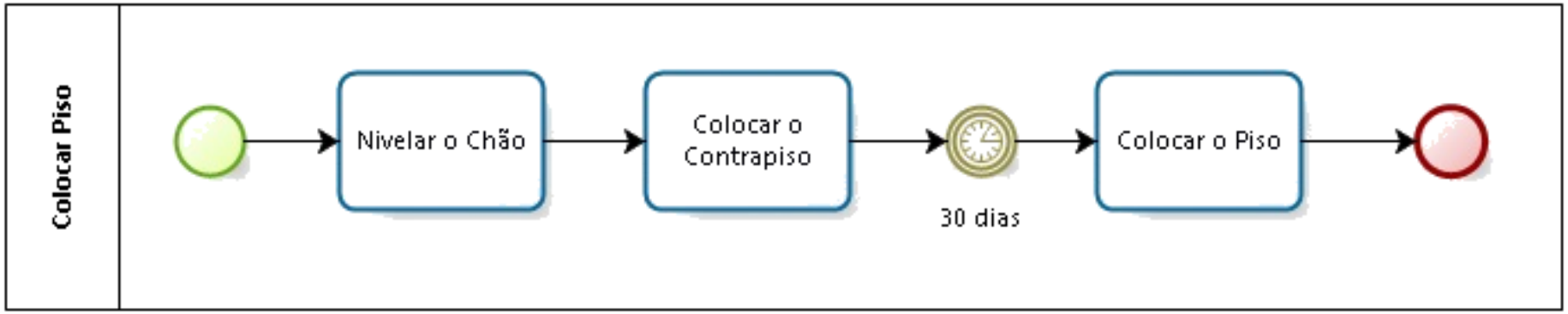


Advanced Concepts of BPMN 2.0

Events

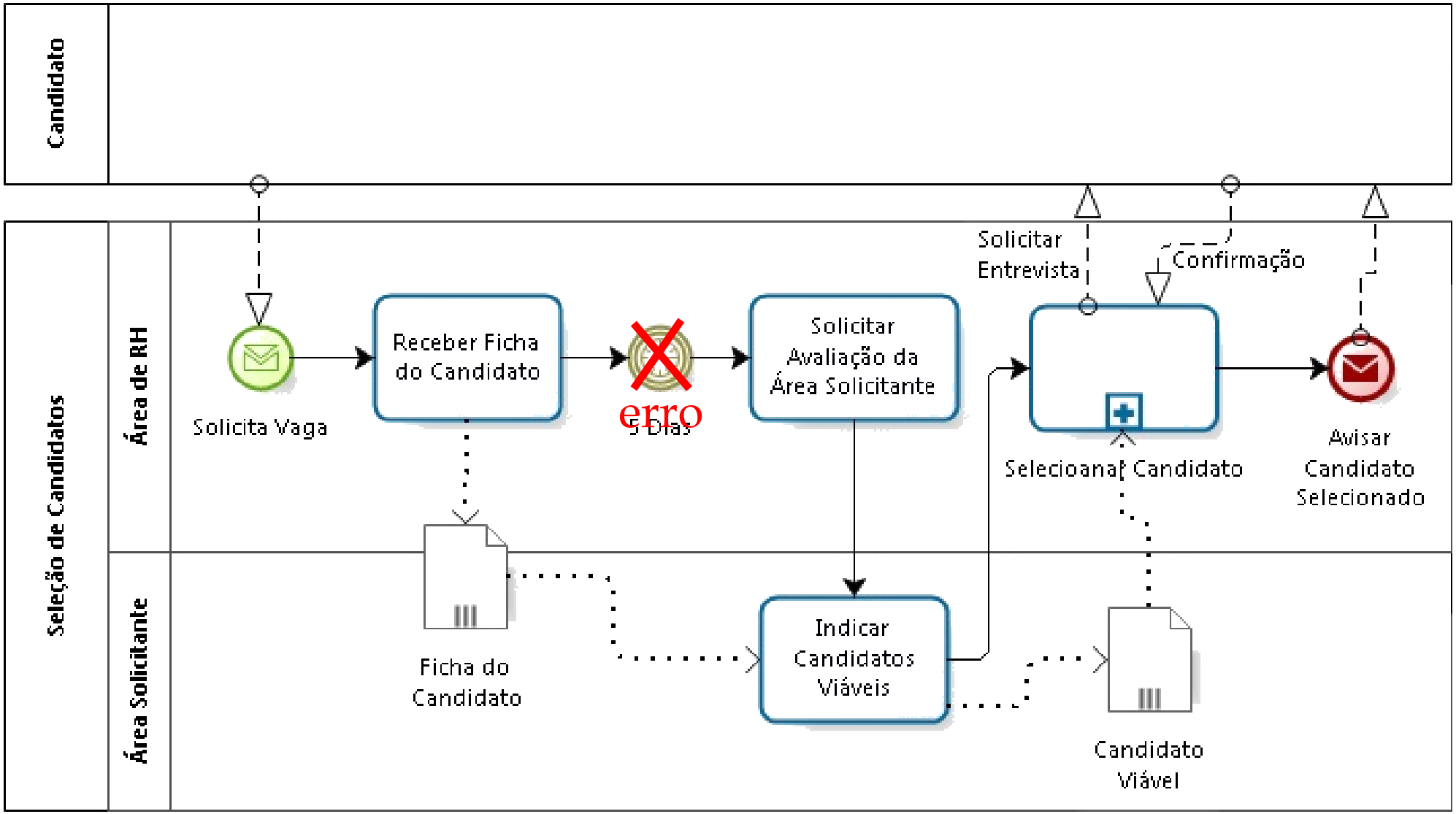
- Imagine a process that you need to determine the time between activities, such as a construction process.



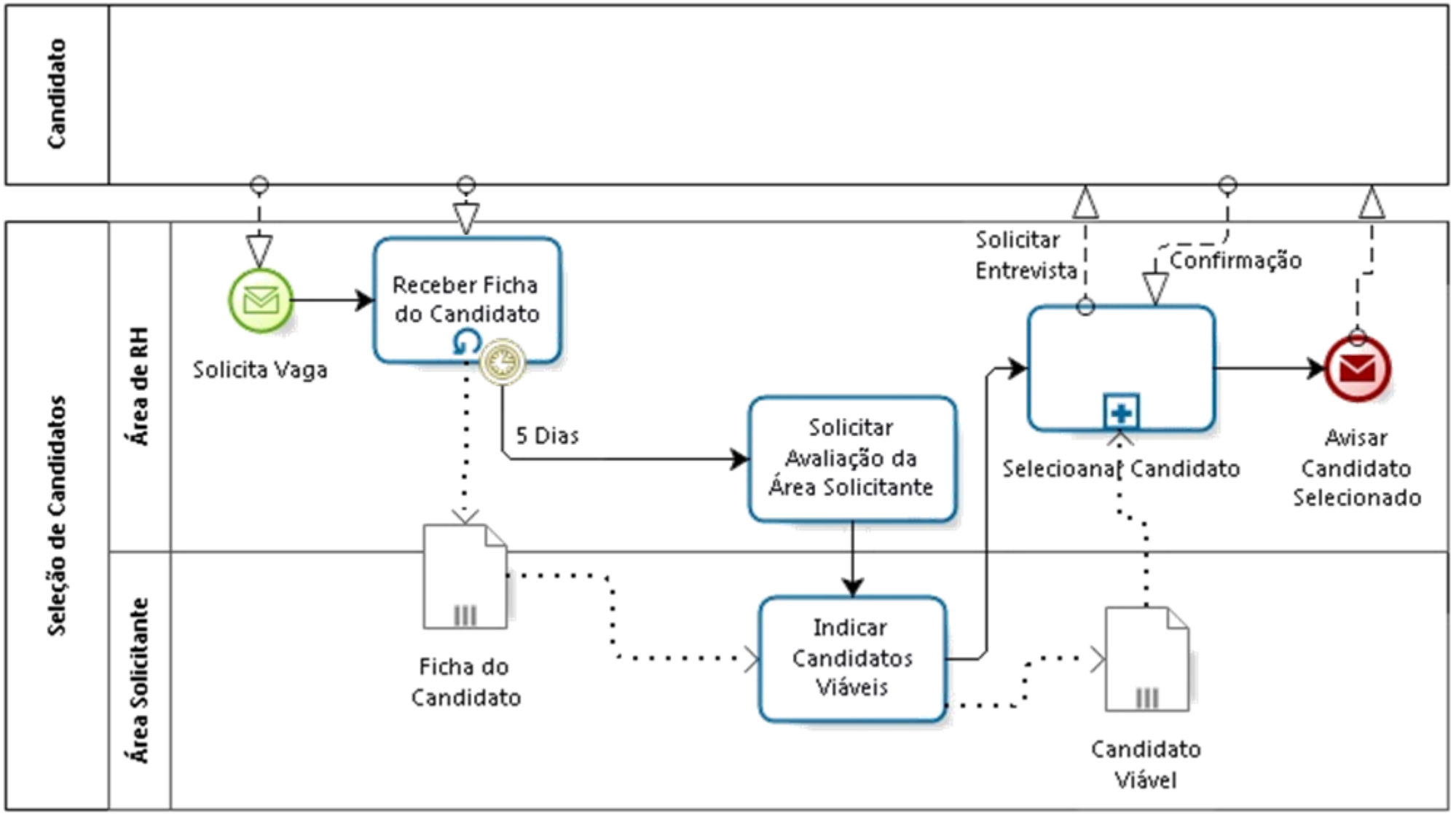
EVENTS

- Imagine another hypothesis: to determine the maximum time for performing an activity, not the time interval between activities.
  - For example, a process of selection of candidates in an HR department, which involves receiving the candidates' files no later than 5 days.

EVENTS

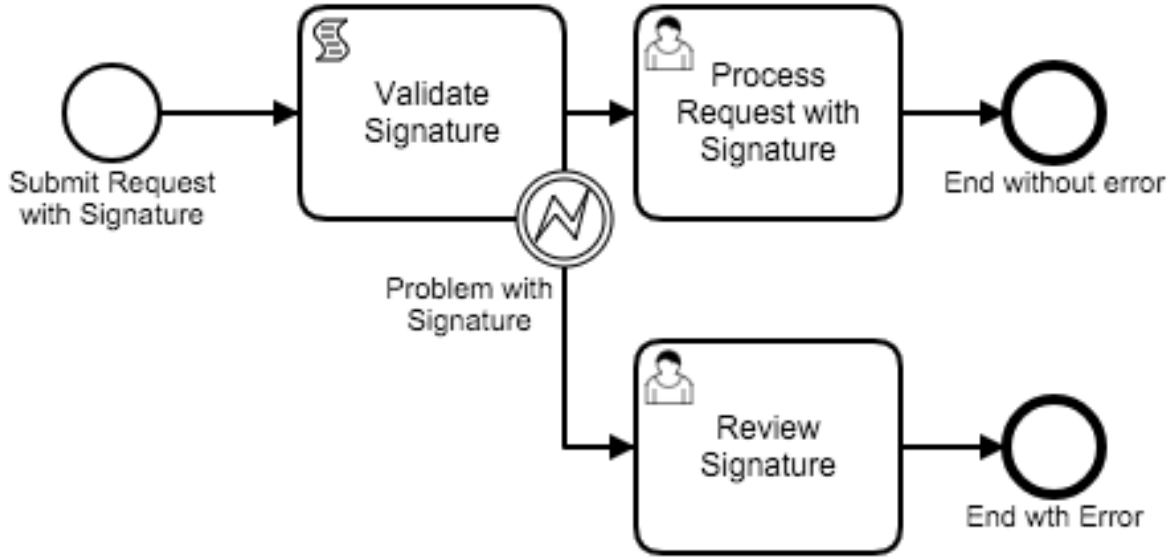

Candidato
Seleção de Candidatos
Área de RH
Área Solicitante
Solicita Vaga
Receber Ficha do Candidato
5 Dias
erro
Solicitar Avaliação da Área Solicitante
Solicitar Entrevista
Confirmação
Selecionar Candidato
Avisar Candidato Selecionado
Ficha do Candidato
Indicar Candidatos Viáveis
Candidato Viável

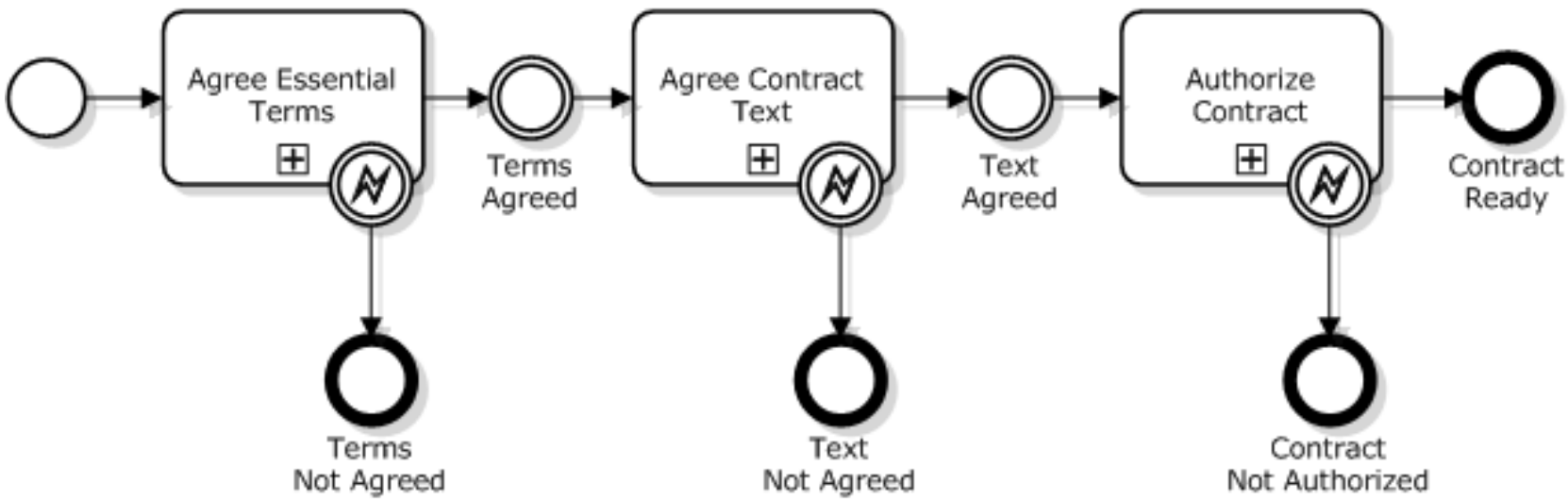
Interruptive Events



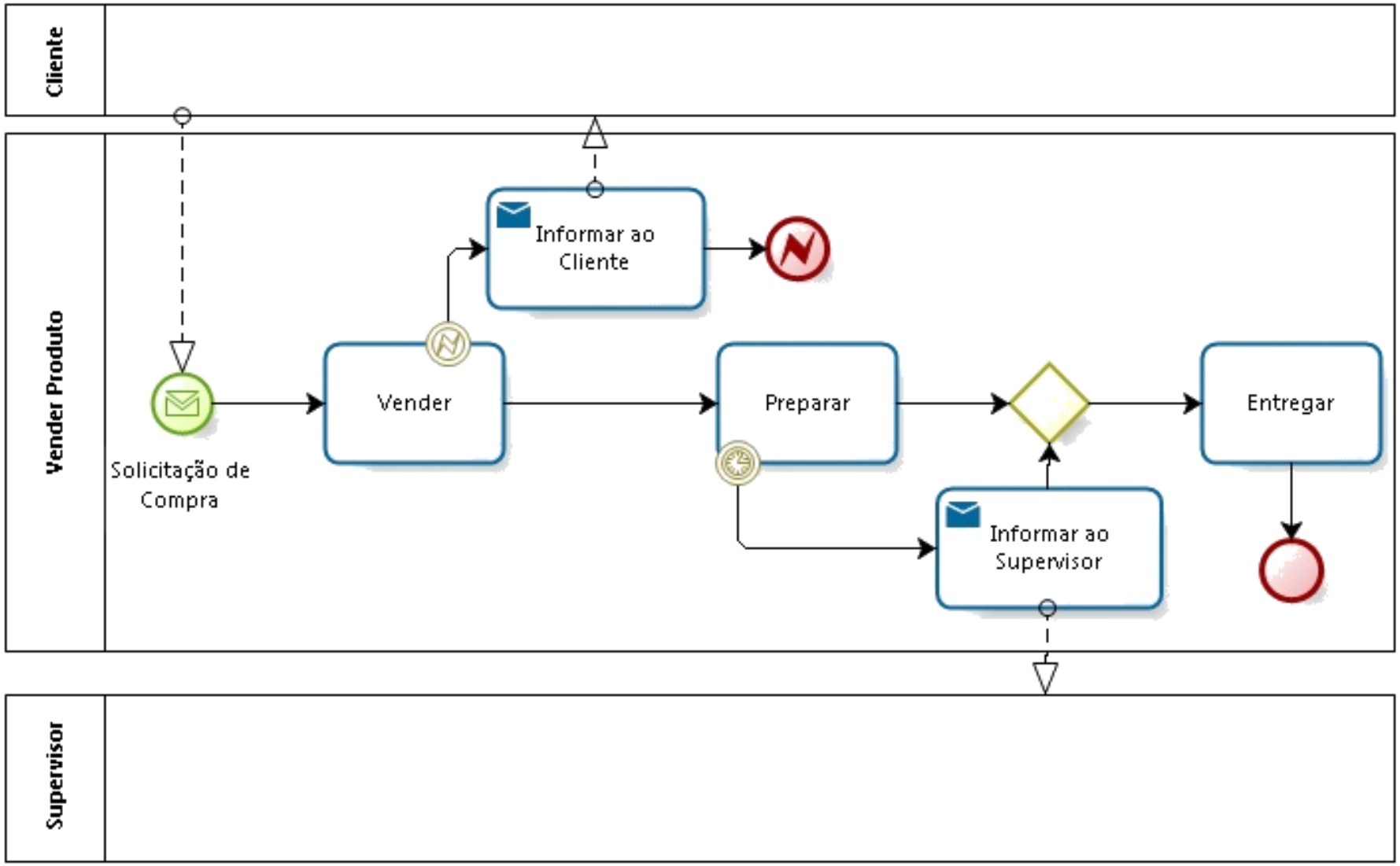
Error Event

- It deals with occurrences outside the normal or desired flow
  - So far, one way to handle these exceptions is through gateways added right after an activity, identifying something like “OK?" or “Not OK?"
  - But, the right thing is to identify them by an edge event that can be triggered at any time during the execution of the activity

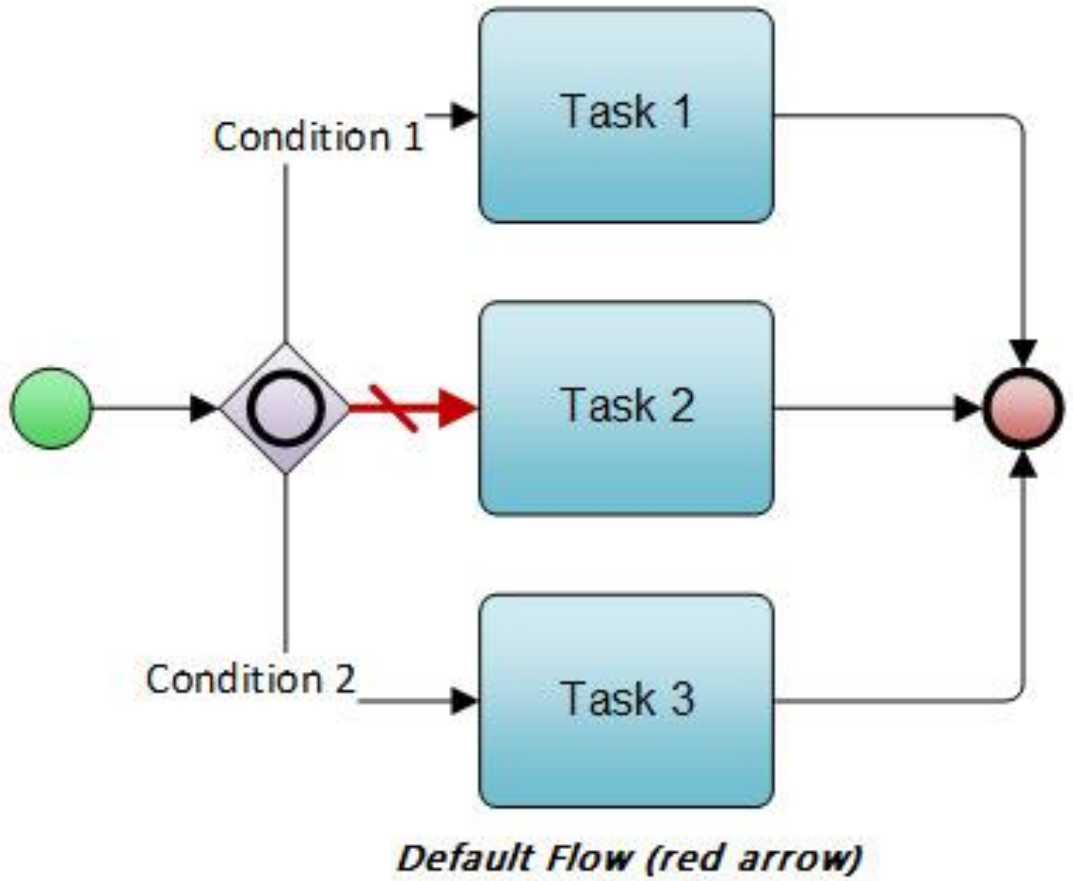

Submit Request with Signature
Validate Signature
Process Request with Signature
End without error
Problem with Signature
Review Signature
End wth Error


Agree Essential Terms
Terms Agreed
Agree Contract Text
Text Agreed
Authorize Contract
Contract Ready
Terms Not Agreed
Text Not Agreed
Contract Not Authorized

Error Event


Cliente
Vender Produto
Supervisor
Informar ao Cliente
Solicitação de Compra
Vender
Preparar
Informar ao Supervisor
Entregar

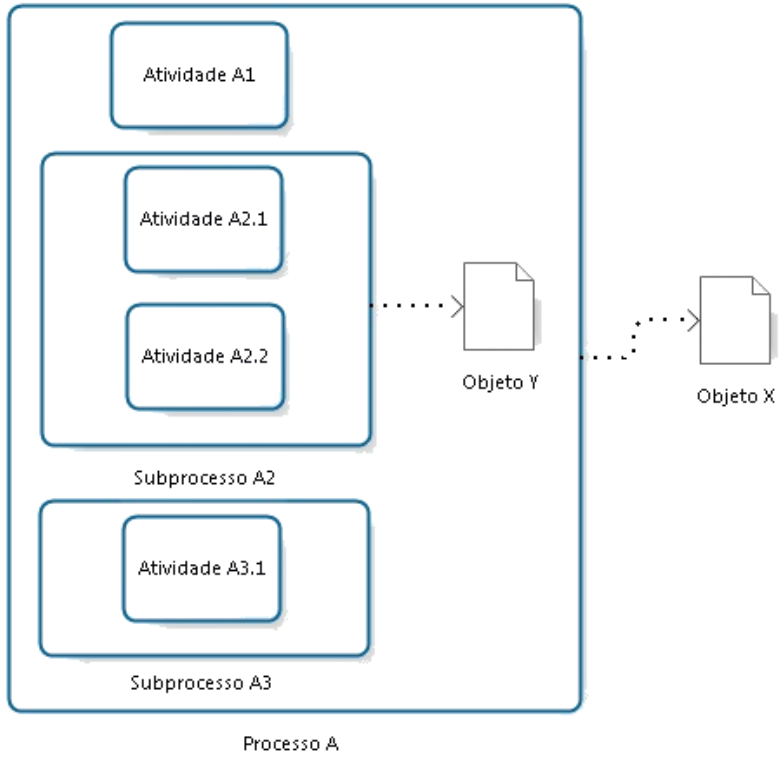
Default flow



Default Flow (red arrow)

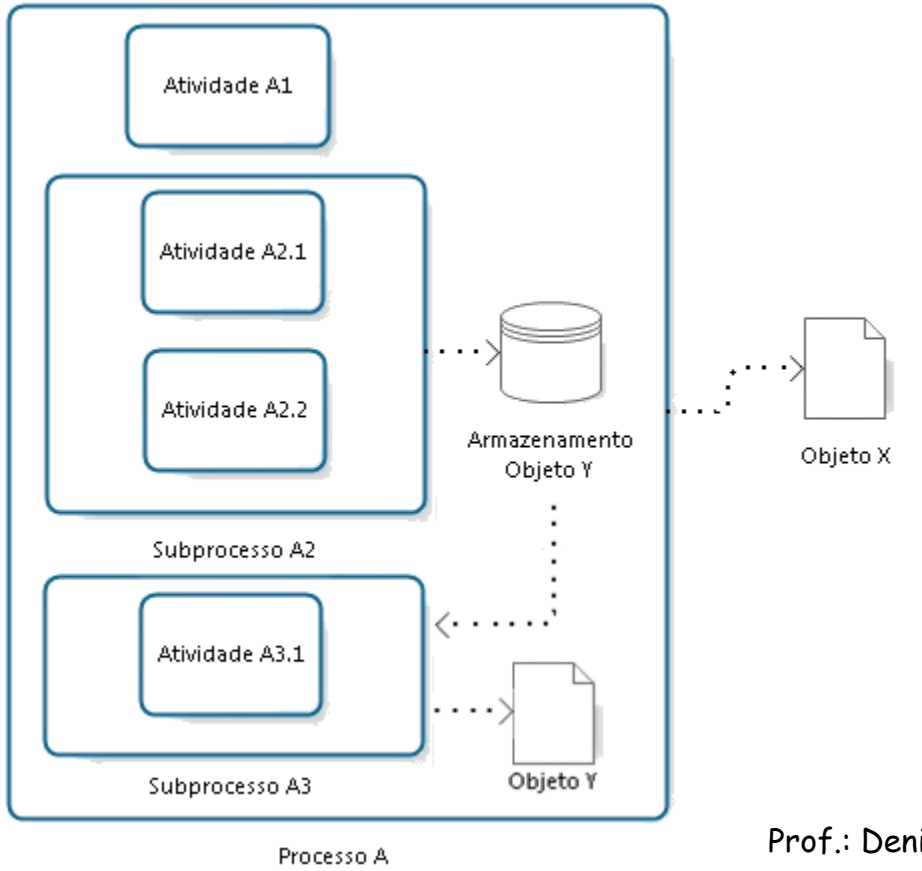
Visibility of *DATA OBJECT*

- Objects are temporary forms of data, their scope of visibility depends on their point of creation.



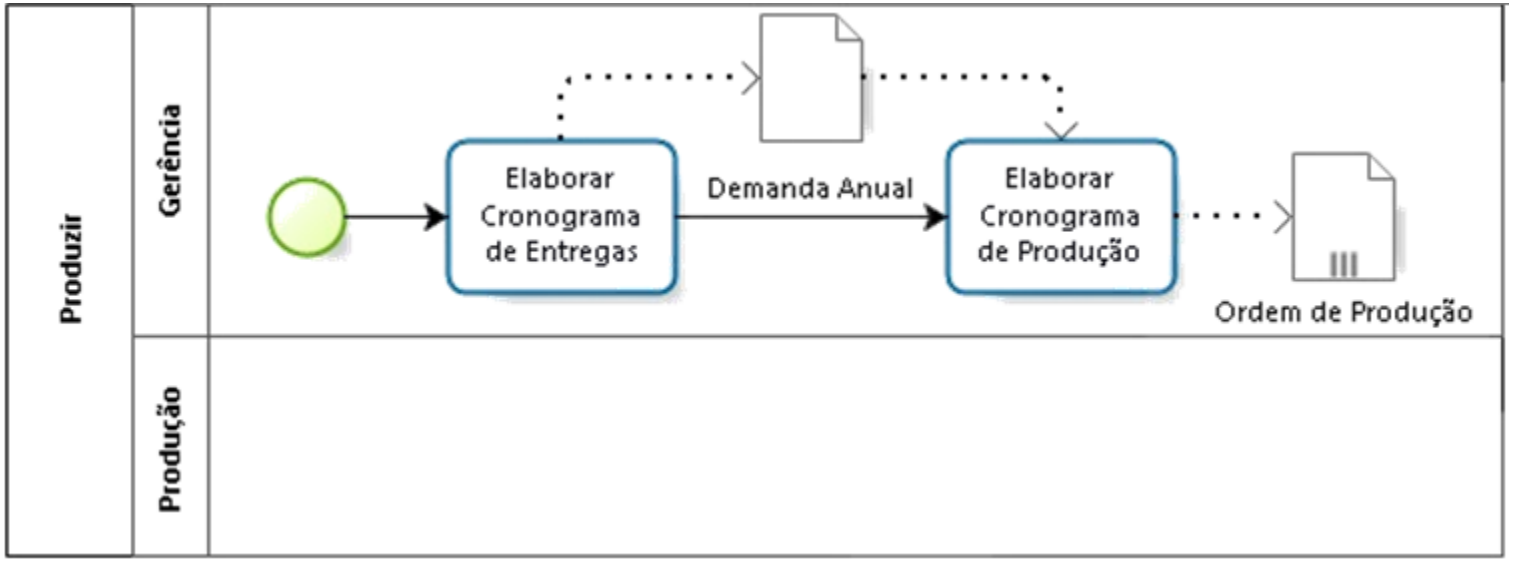
DATA STORE

- They are persistent data, which once created, continue to exist during the process and can be accessed from any other process, subprocess or activity



Data Collection

- It is represented by an internal identifier with three vertical dashes, means a set of data of the same type

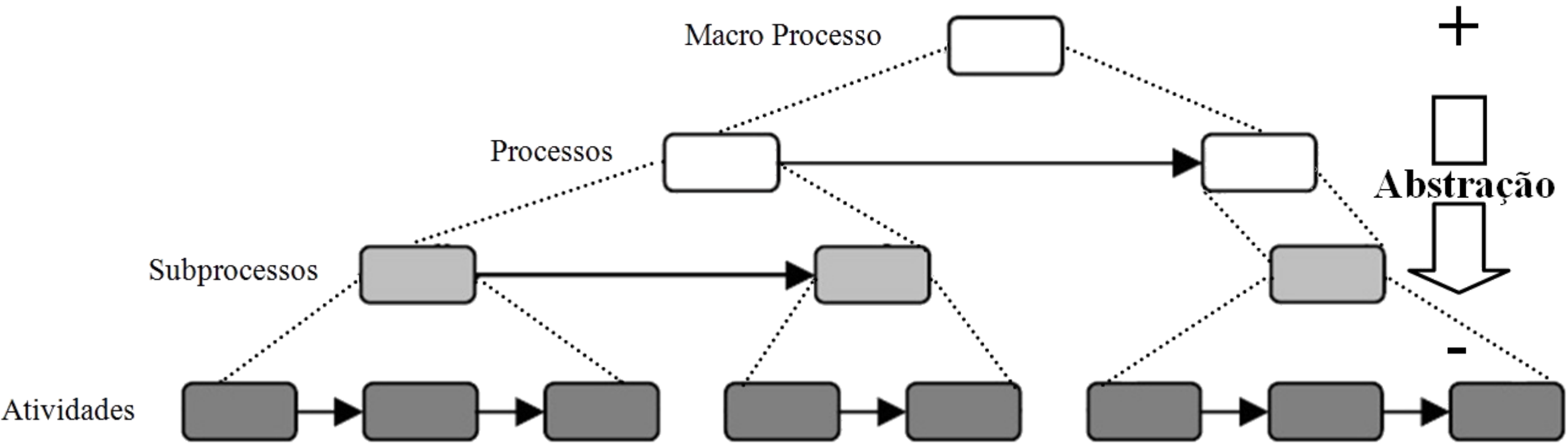


Functional Decomposition

- It's easier to solve a complex problem when you break it down into manageable parts
  - This principle addresses human limitations in dealing with complexity, allowing the designer to focus on one subject or feature at a time.

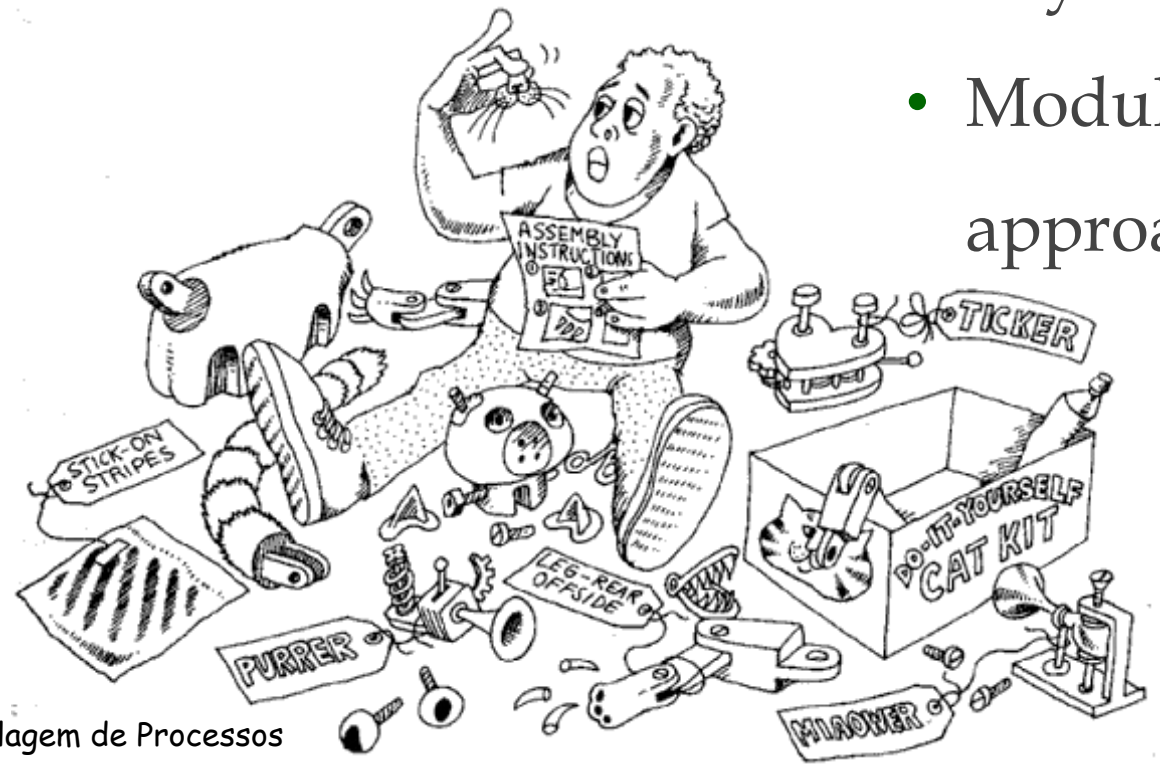
Abstraction levels

- When considering a modular solution to any problem, many levels of abstraction can be raised.

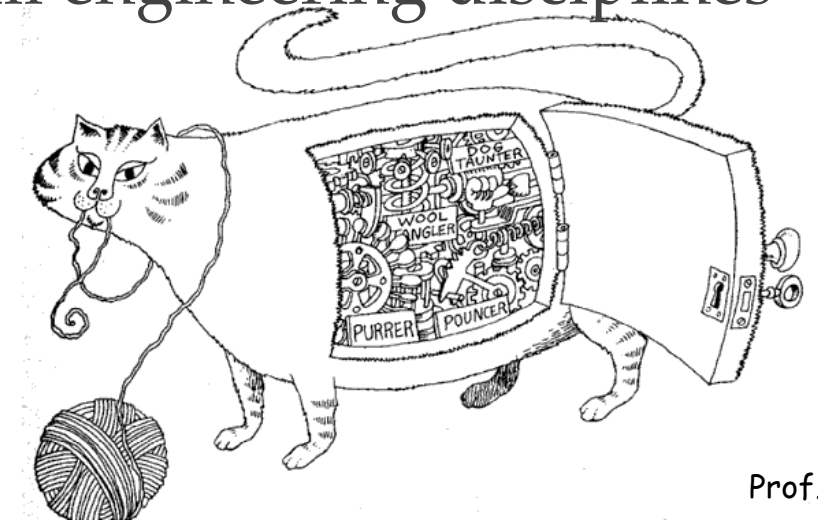


Modularization

- It is the process of dividing a whole into well-defined parts, called modules, that can be constructed and examined separately and interact in a well-defined way.



- Modularization has become an accepted approach in all engineering disciplines



MODULES

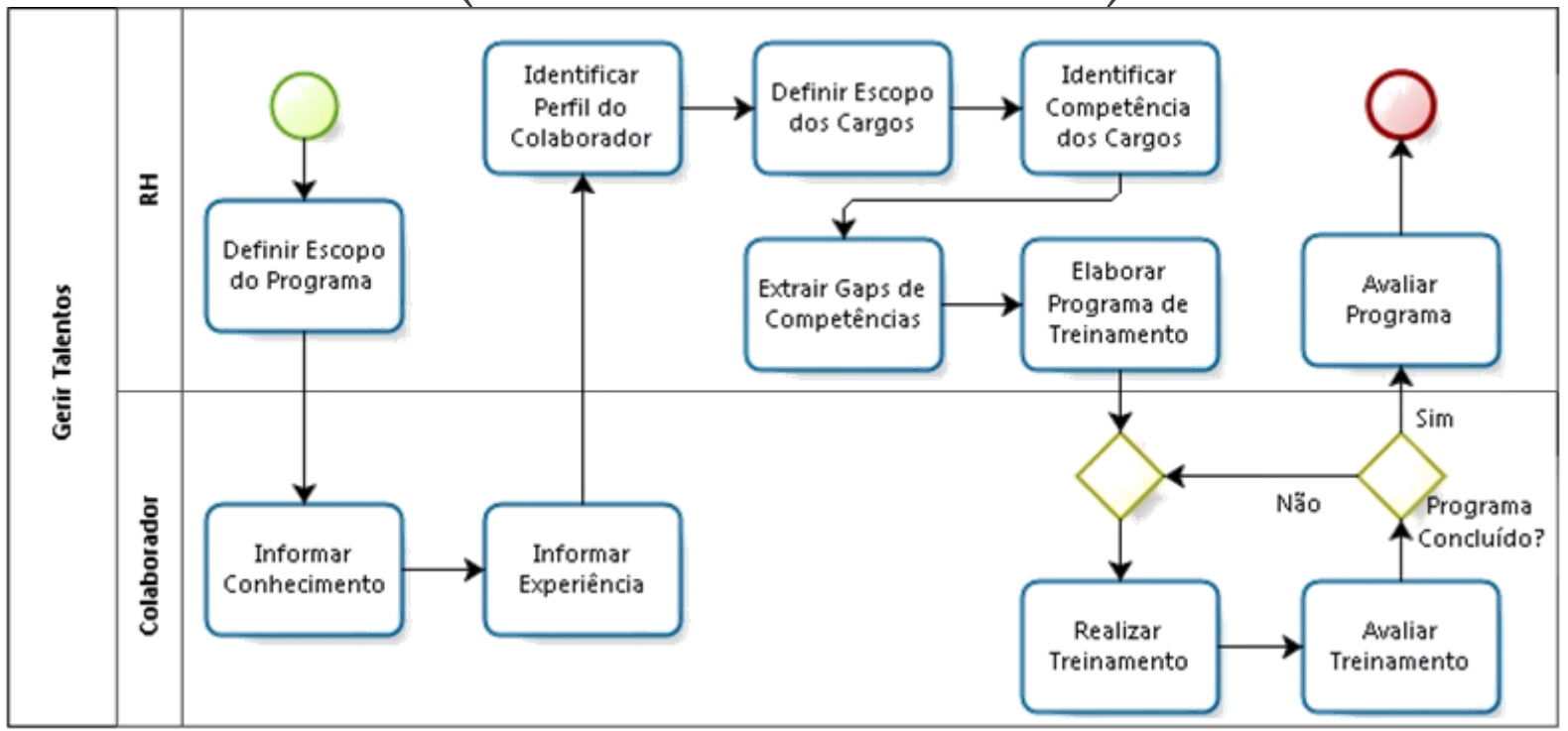
- They are essential functional units, self-contained in relation to the whole of which it is part, having standardized interfaces that allow, by means of combinations the composition of the whole.

Independent Modules

- Functional independence is achieved by the development of modules (processes) that have a "single purpose" and an "aversion" to excessive interaction with other modules (processes)
- Independence is measured using two qualitative criteria: cohesion and coupling.

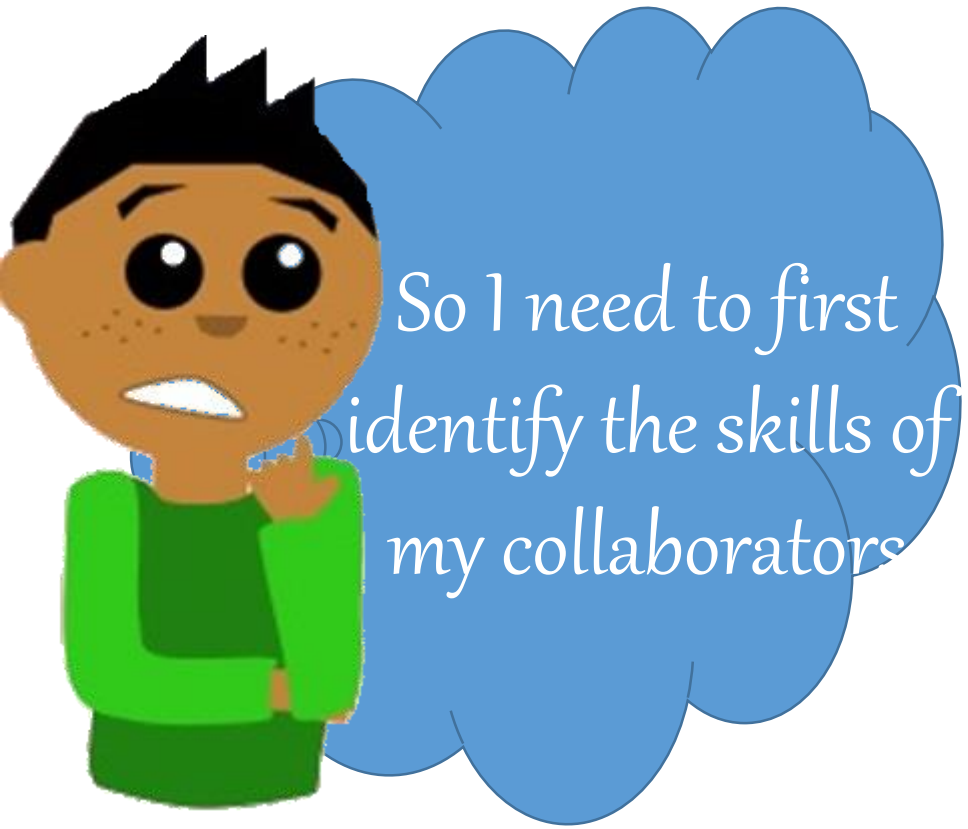
Example

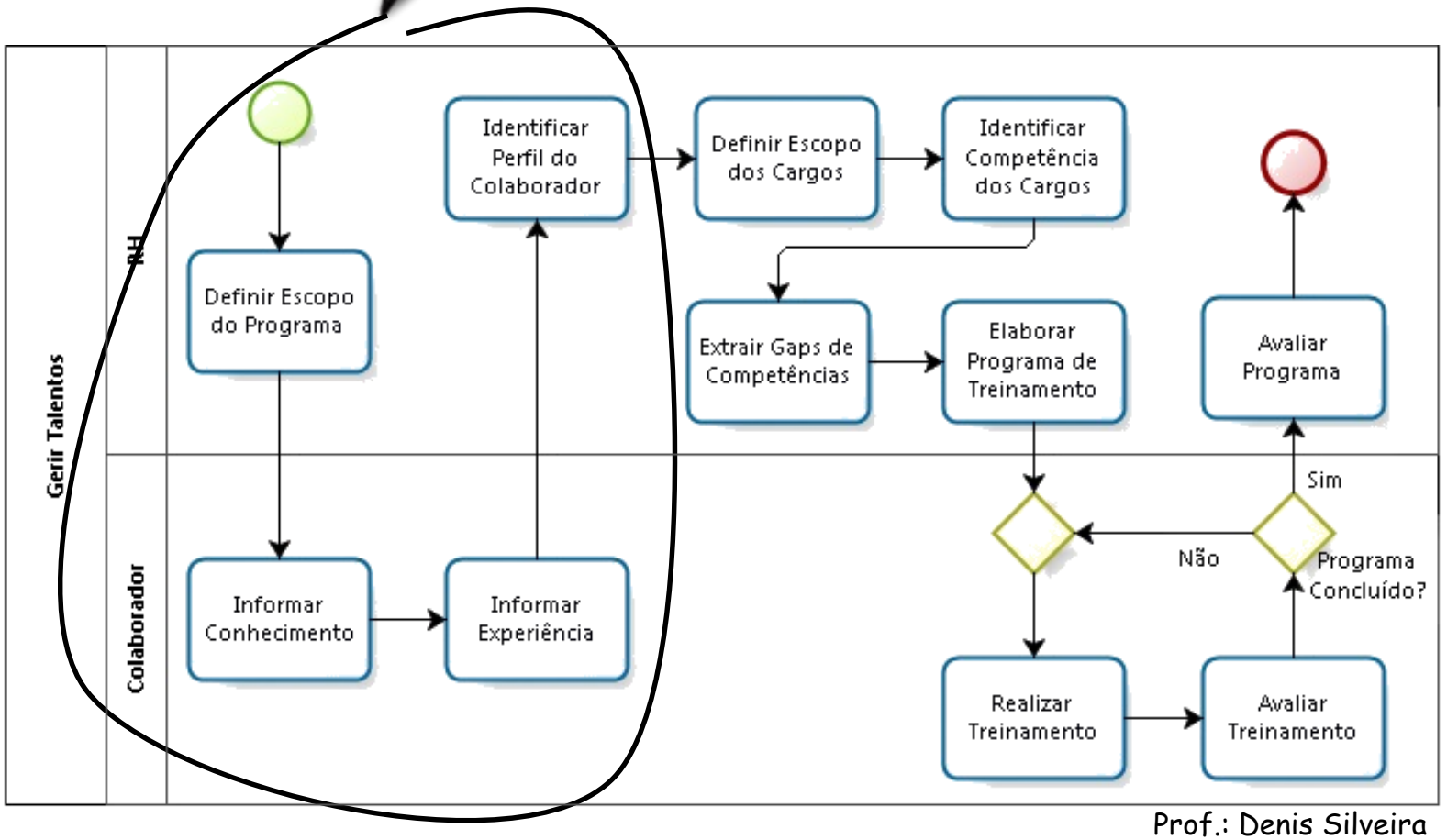
- The natural tendency of most designers, especially the less experienced, is to build models with many elements, which makes them difficult to read (maintain and reuse).



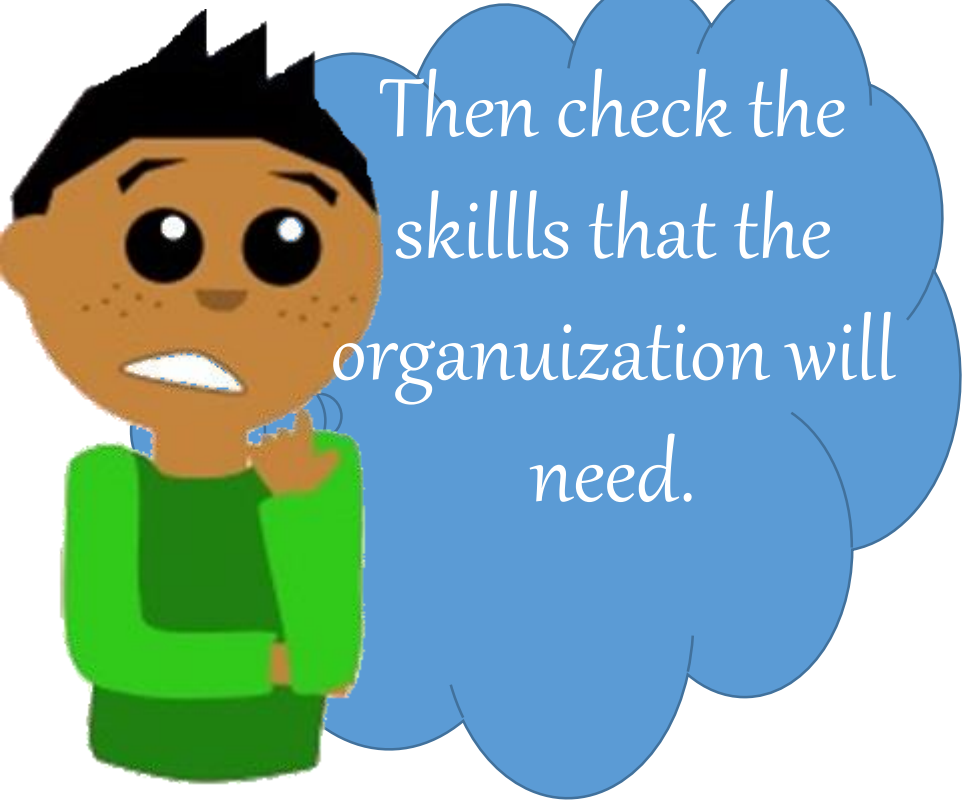
Example

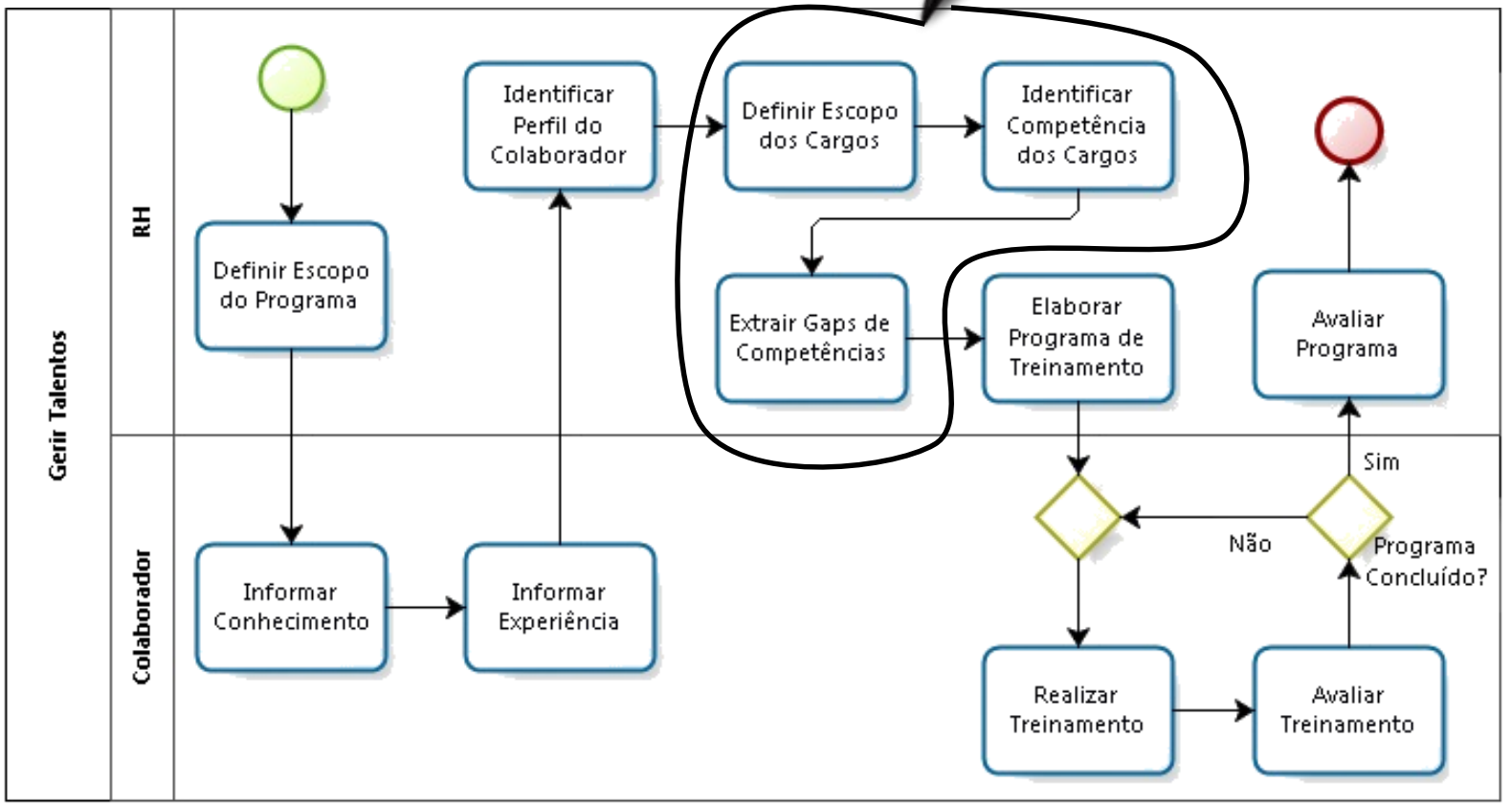
- The organization wants to train its employees, through the necessary training.





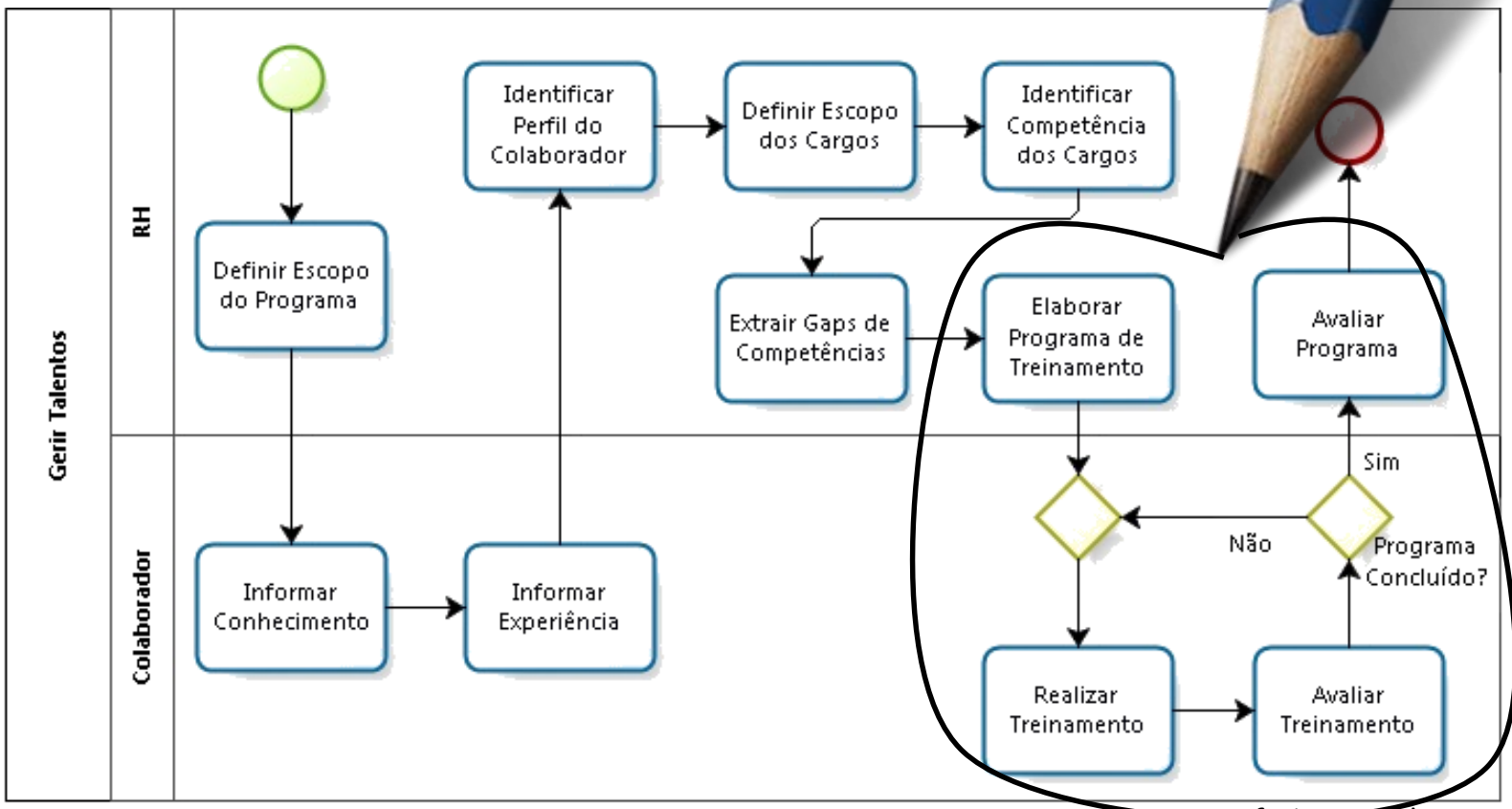
Example


Then check the skillls that the organuization will need.


Gerir Talentos
RH
Colaborador
Definir Escopo do Programa
Identificar Perfil do Colaborador
Definir Escopo dos Cargos
Identificar Competência dos Cargos
Extrair Gaps de Competências
Elaborar Programa de Treinamento
Avaliar Programa
Sim
Não
Programa Concluído?
Informar Conhecimento
Informar Experiência
Realizar Treinamento
Avaliar Treinamento

Example


Now I need to compare with existing ones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Não
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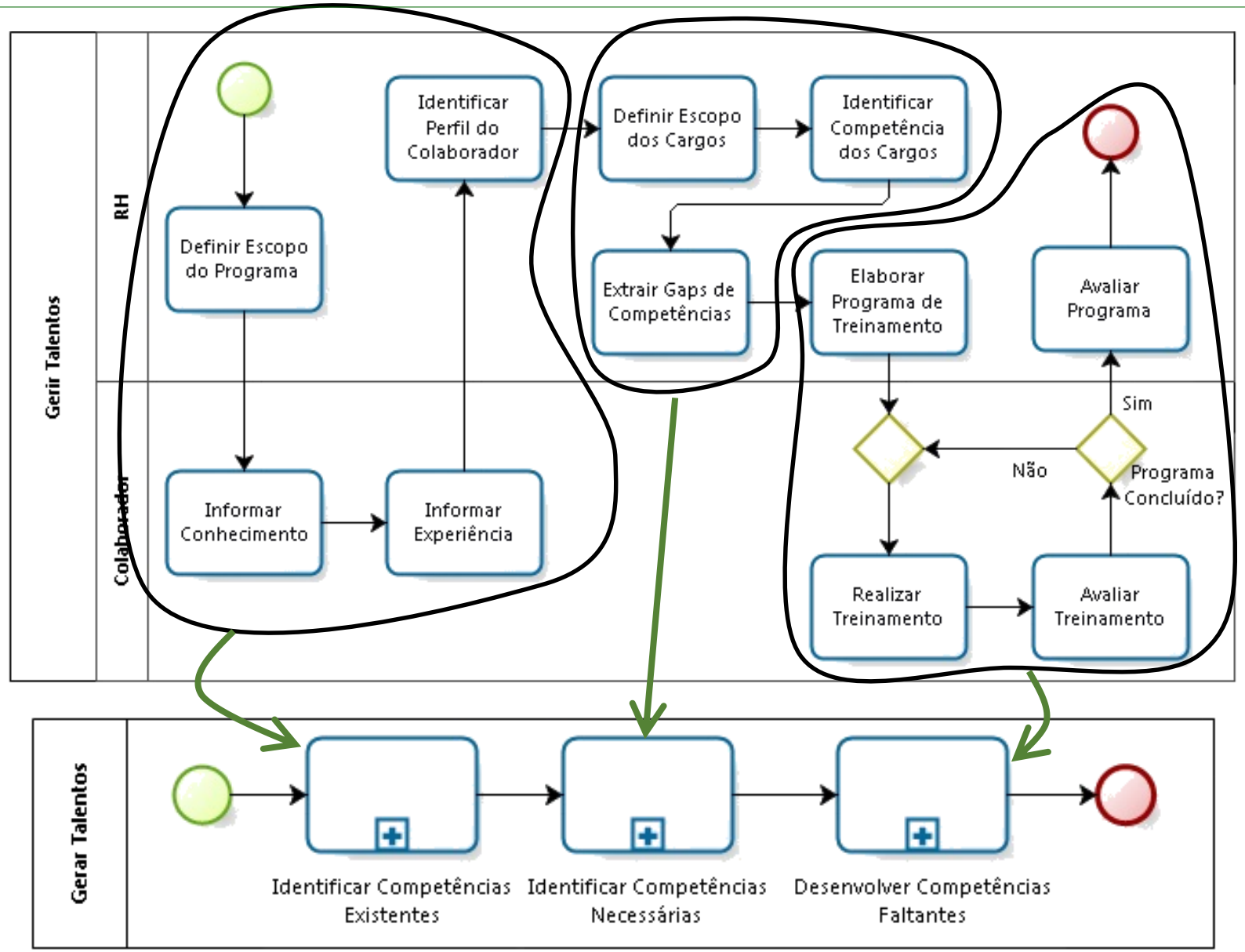
So...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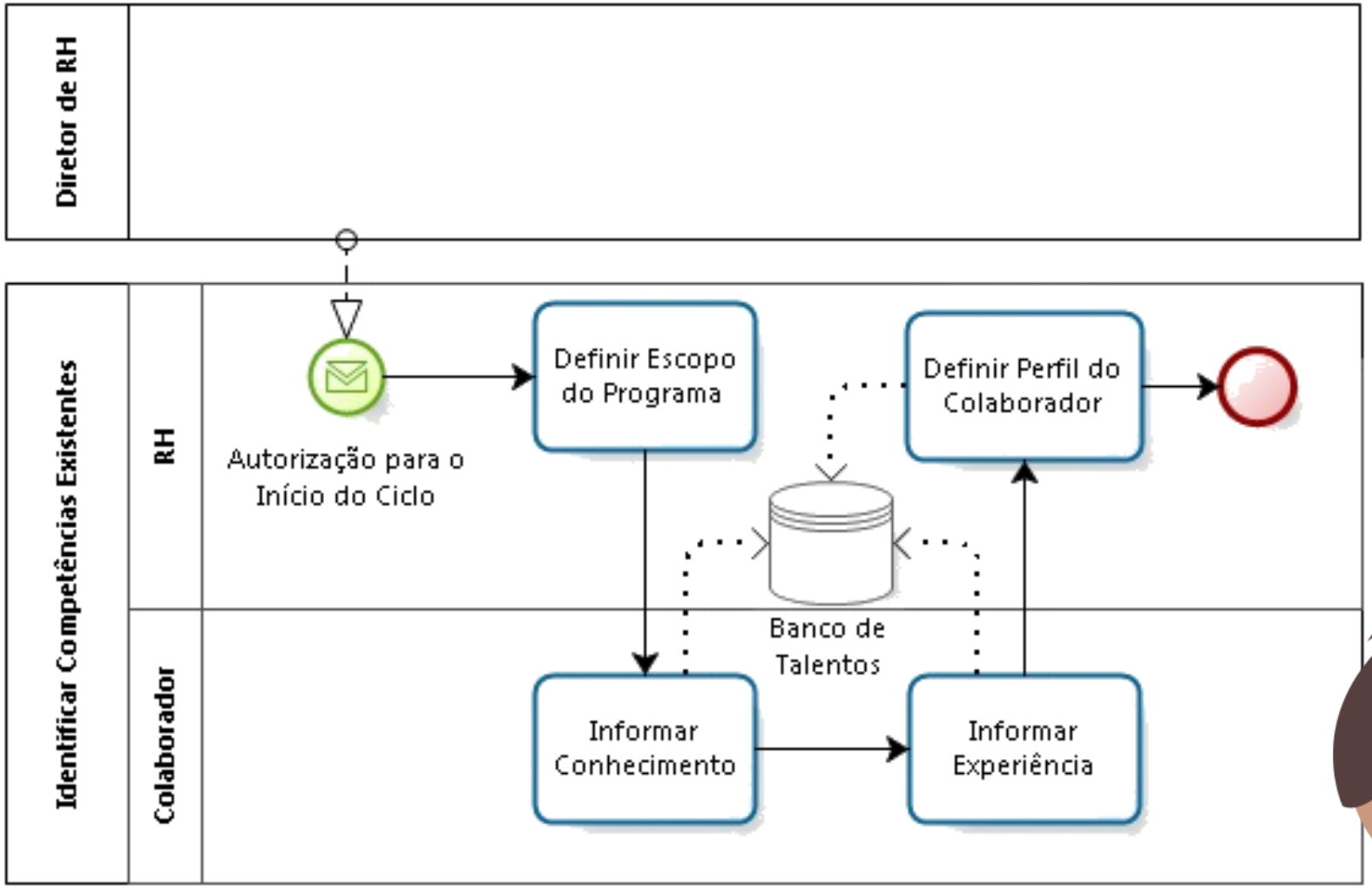
Gerar Talentos
Identificar Competências Existentes
Identificar Competências Necessárias
Desenvolver Competências Faltantes

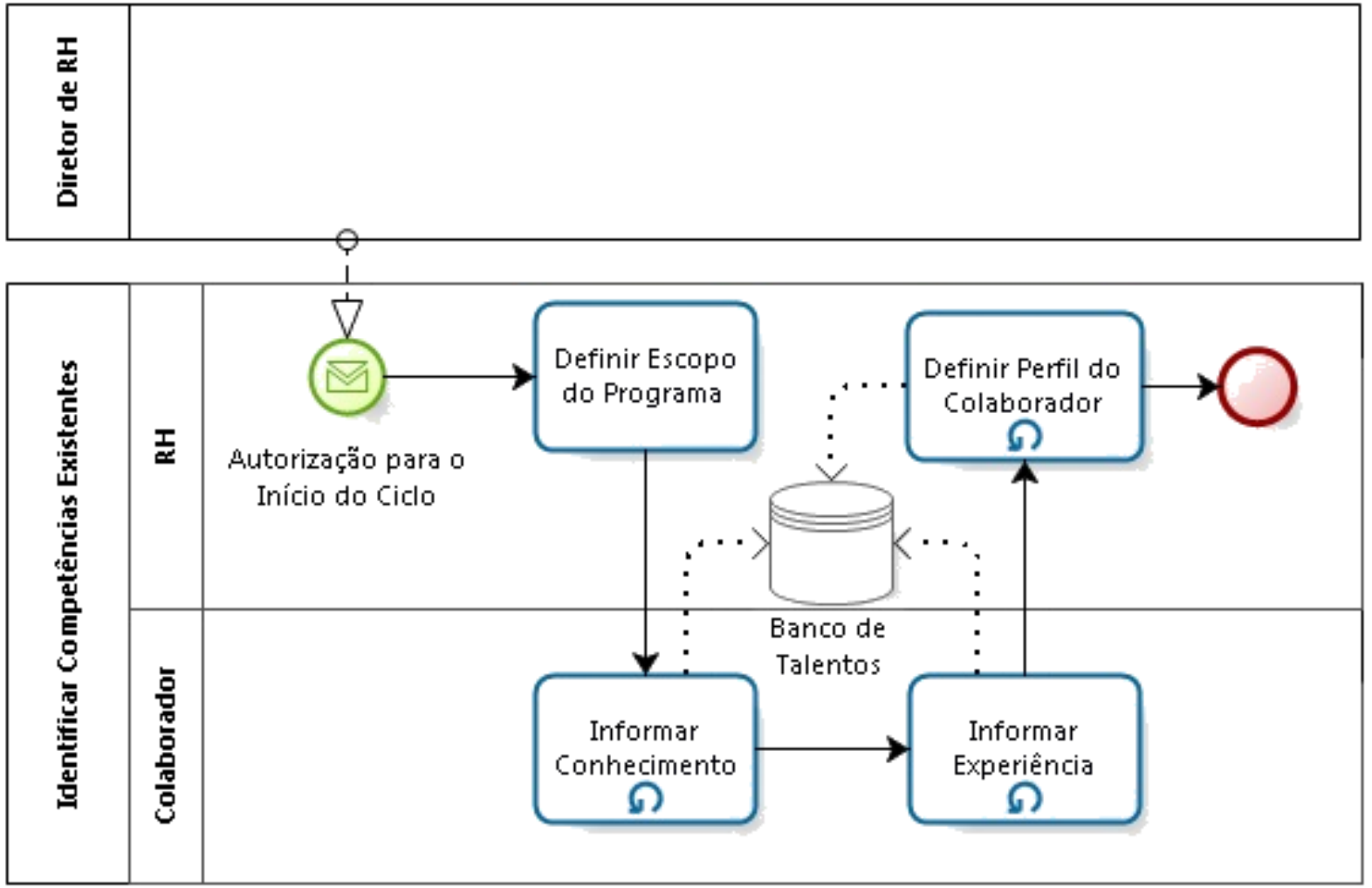
UM EXEMPLO

Identificar Competências Existentes



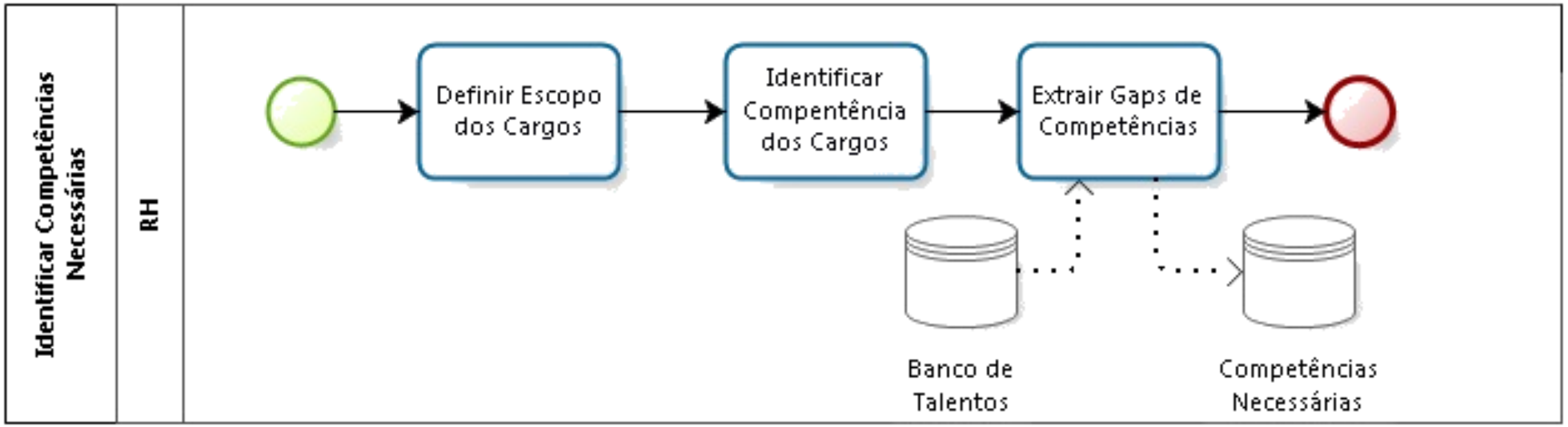
UM EXEMPLO

Identificar Competências Existentes

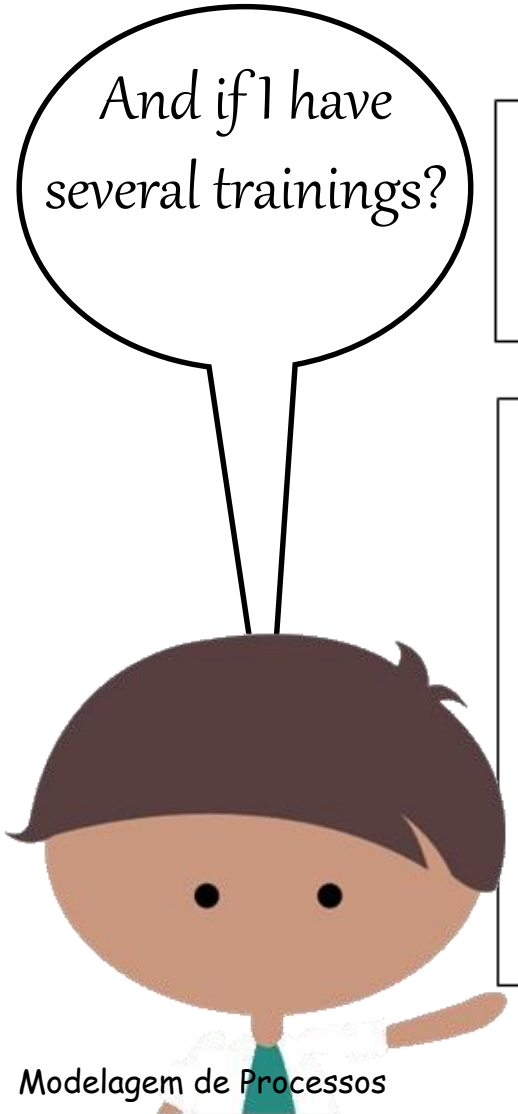


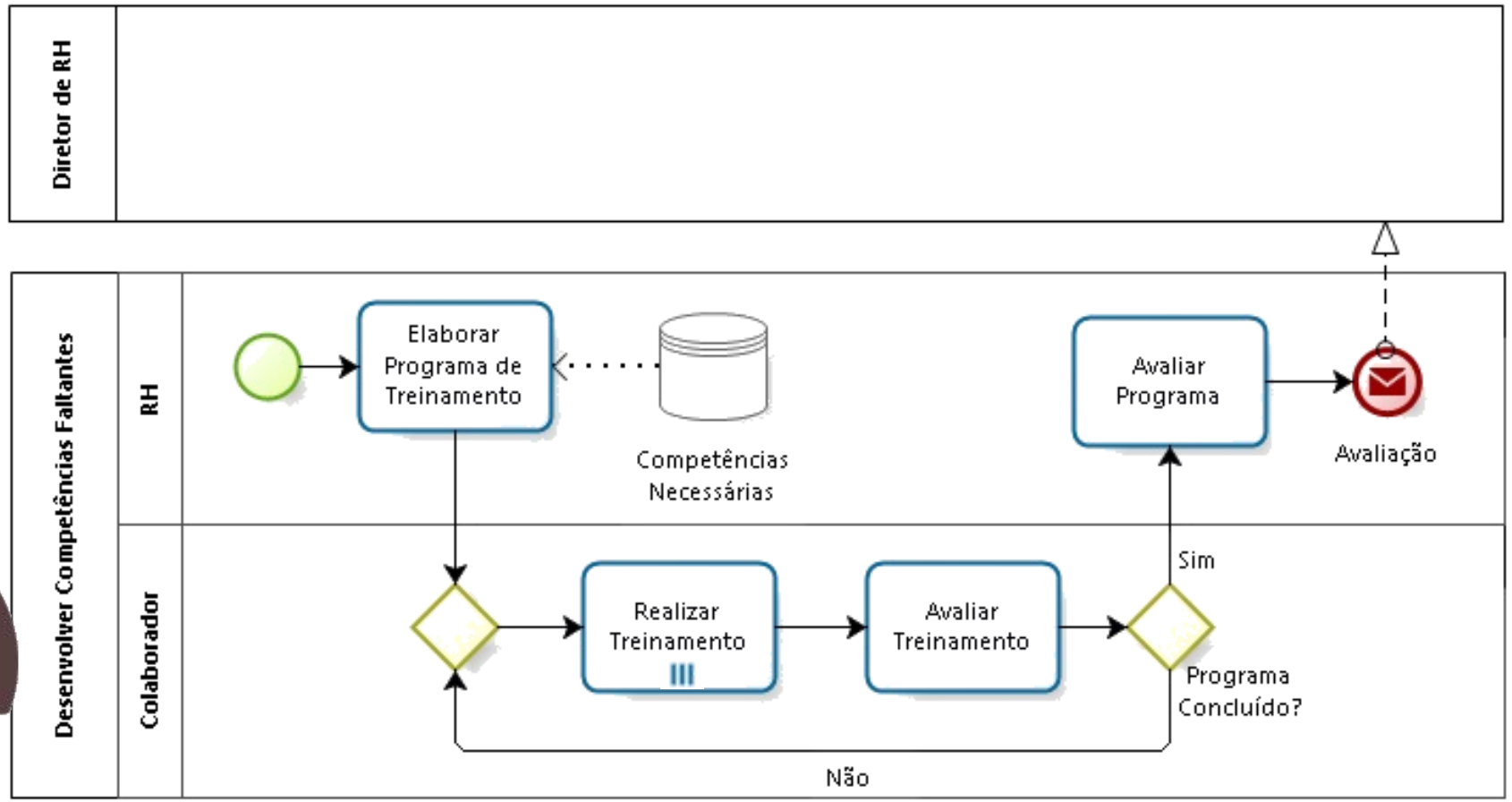
UM EXEMPLO


Identificar Competências
Necessárias


Identificar Competências Necessárias
RH
Definir Escopo dos Cargos
Identificar Compentência dos Cargos
Extrair Gaps de Competências
Banco de Talentos
Competências Necessárias

Example


And if I have several trainings?


Diretor de RH
Desenvolver Competências Faltantes
RH
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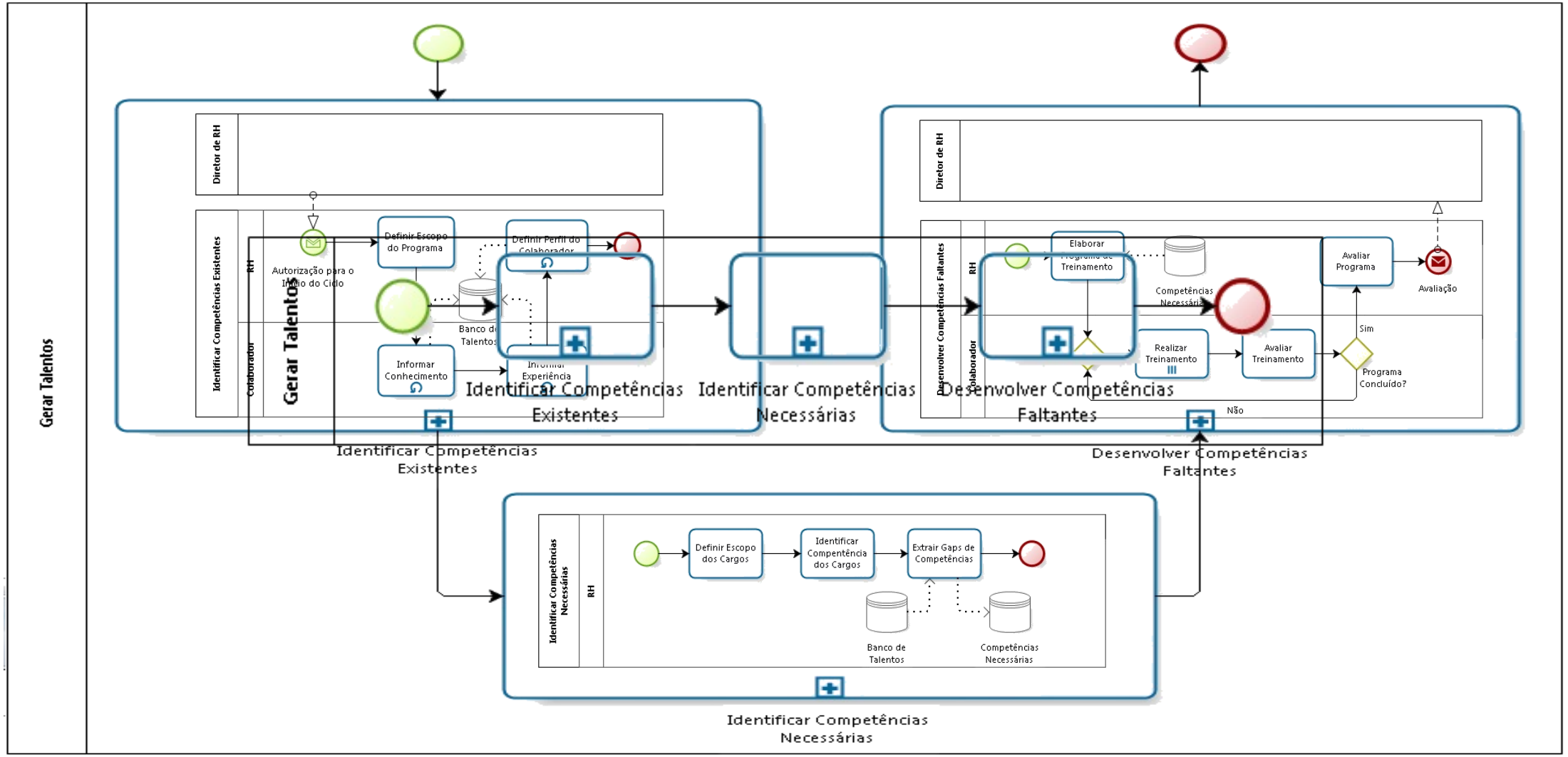
Elaborar Programa de Treinamento
Competências Necessárias
Avaliar Programa
Avaliação
Realizar Treinamento
Avaliar Treinamento
Sim
Programa Concluído?
Não


Desenvolver Competências Faltantes

EXAMPLE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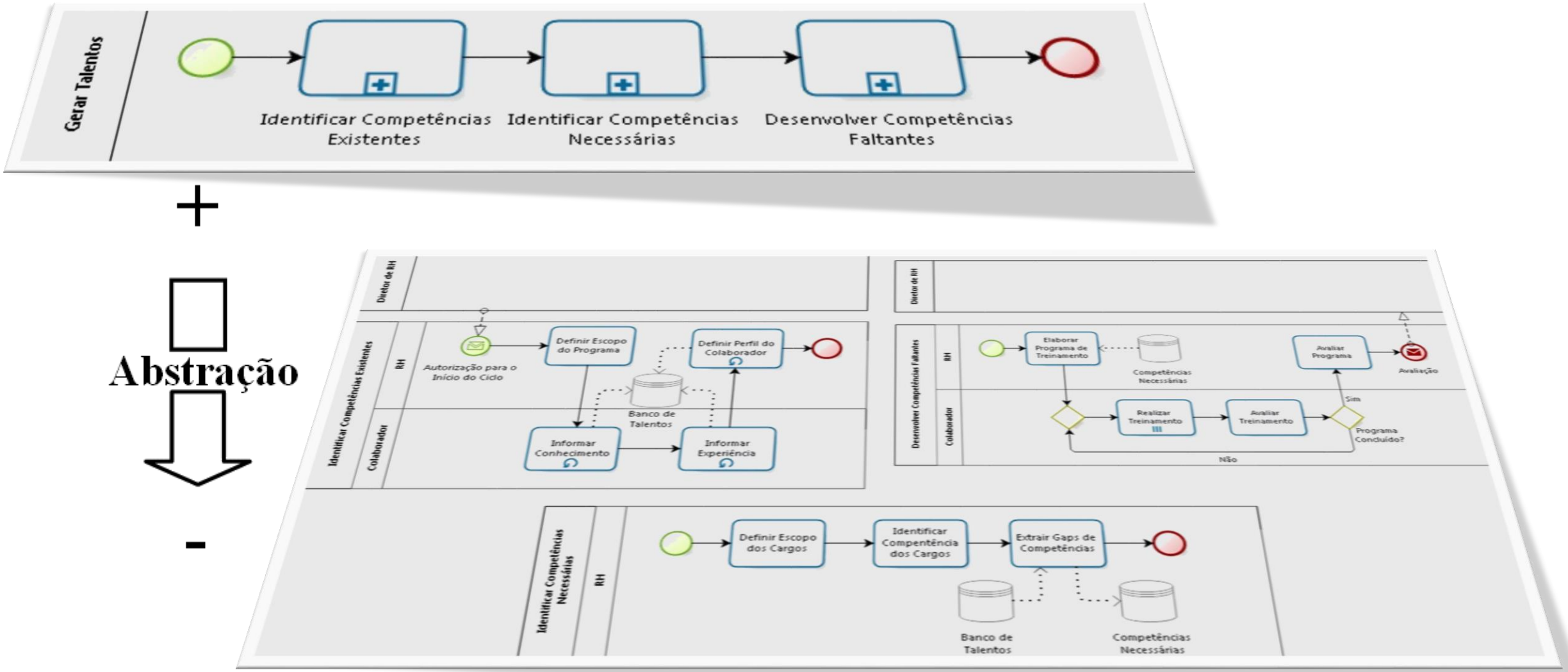
UM EXEMPLO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Identificar Competências Necessárias
Desenvolver Competências Faltantes
+
Abstração
-
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- SHAPIRO, R.; WHITE, S. A.; PALMER, N.; MUEHLEN, M.; ALLWEYER, T.; GAGNÉ, D.; *et al.*, BPMN 2.0 Handbook, Edited by Layna Ficher, http://www.bpm-guide.de/wp-content/uploads/2011/09/BPMN-2.0-Handbook-Camunda.pdf.