

BPMN 2.0 Syntax and Positioning

Business Process Model and Notation (BPMN) is a graphical representation for specifying business processes in a business process model. It is also known as Business Process Modeling Notation.

The primary goal of BPMN is to provide a standard notation understandable by all business stakeholders, serves as a common language, bridging the communication gap that frequently occurs between business process design and implementation.

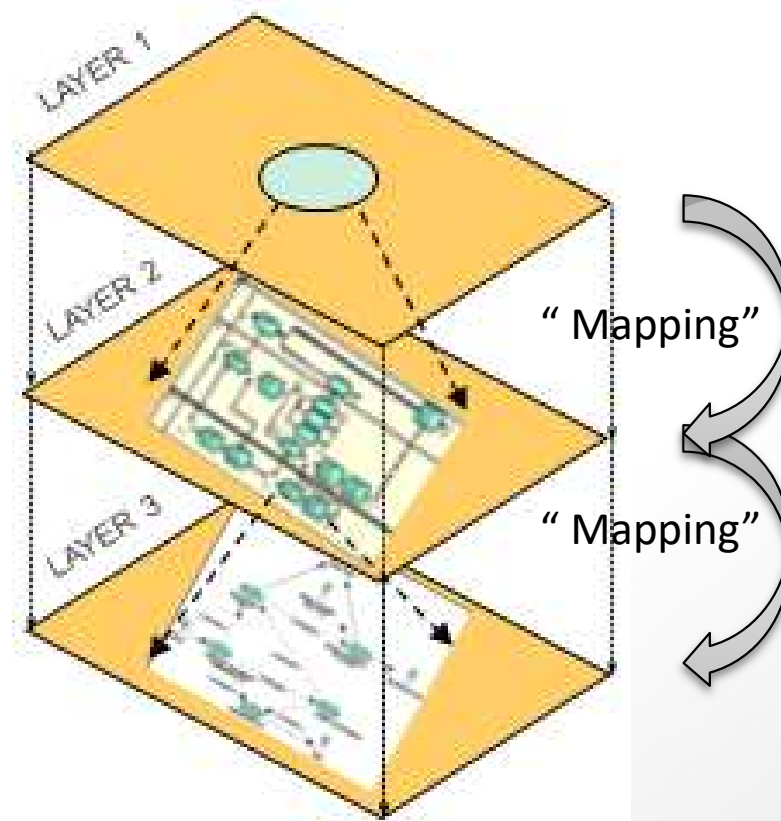


- Part I: Positioning of BPMN
- Part II: Syntax of BPMN
- Part III: The complete syntax of BPMN
- Part IV: What is DMN ?
- Part V: BPMN Case
- Part VI: BPMN Tools
- Q&A

- The Business Blueprint
- 3D Enterprise Blueprinting Framework
 - The 3-layers
 - Visibility and traceability
- Positioning of BPMN in the 3D Enterprise Business Blueprint
- Definition of a process
- The New Business Ecosystem
- Business Analysis versus Functional Analysis
- What is ... EA, BPA, BPMS, BPM, BPMN, BPML, BPI, Zachman, XPDL, BPR, Brown Paper, ...
- BPMN versus UML - when to use BPMN and when to use UML

The 3D Enterprise Blueprinting Framework

The 3D Enterprise Blueprinting Framework is an architecture to address the client's **business process** and **software needs**. It is a standard, modular component-based framework that is **technology- or platform-independent**. The power of Business Blueprinting is **traceability** — the ability to see how changes to each layer of business affects the others.



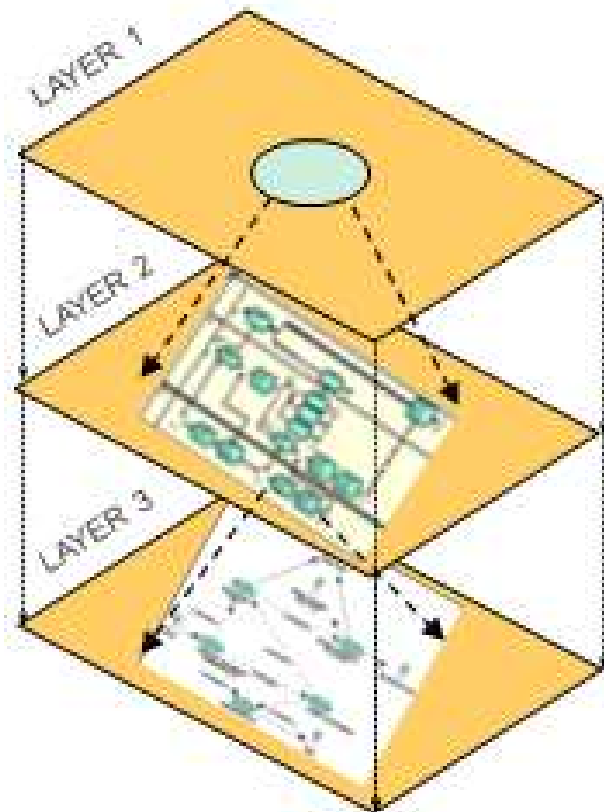
“ 3D Enterprise Blueprinting creates visibility and traceability trough your organization “

“ Changes affect each other ”

The 3D Enterprise Blueprinting Framework – The people

3D Enterprise Blueprinting layers are defined by people throughout your organization.

■ LAYER 1: VISION & STRATEGY



What?

Defines the business vision and operations model of an organization.

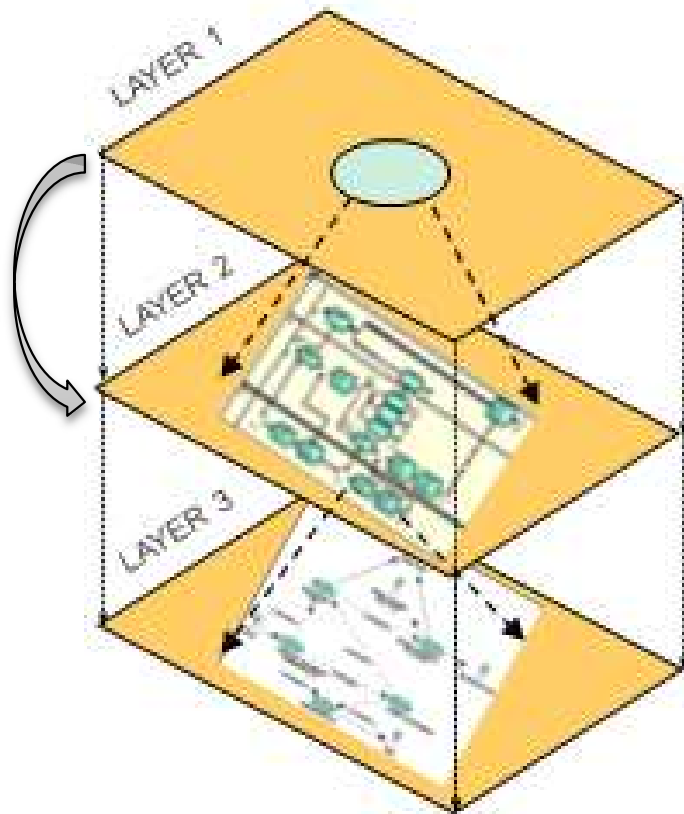
By?

Stakeholders & CEO



The 3D Enterprise Blueprinting Framework – The people

3D Enterprise Blueprinting layers are defined by people throughout your organization.



■ LAYER 2: HIGH LEVEL BUSINESS PROCESS MODEL

What?

Makes clear business processes, separating intellectual assets from implementation systems.

That means when technology changes, processes don't have to be recreated from scratch. This layer include business process optimization.

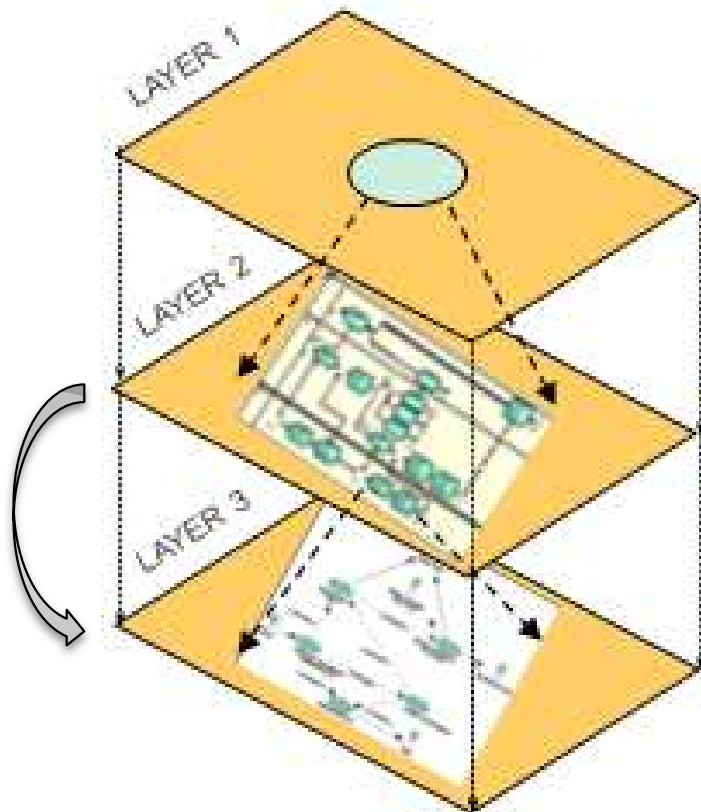
By?

Business managers / Sponsor



The 3D Enterprise Blueprinting Framework – The people

3D Enterprise Blueprinting layers are defined by people throughout your organization.



■ LAYER 3: LOW LEVEL BUSINESS PROCESS MODEL

What?

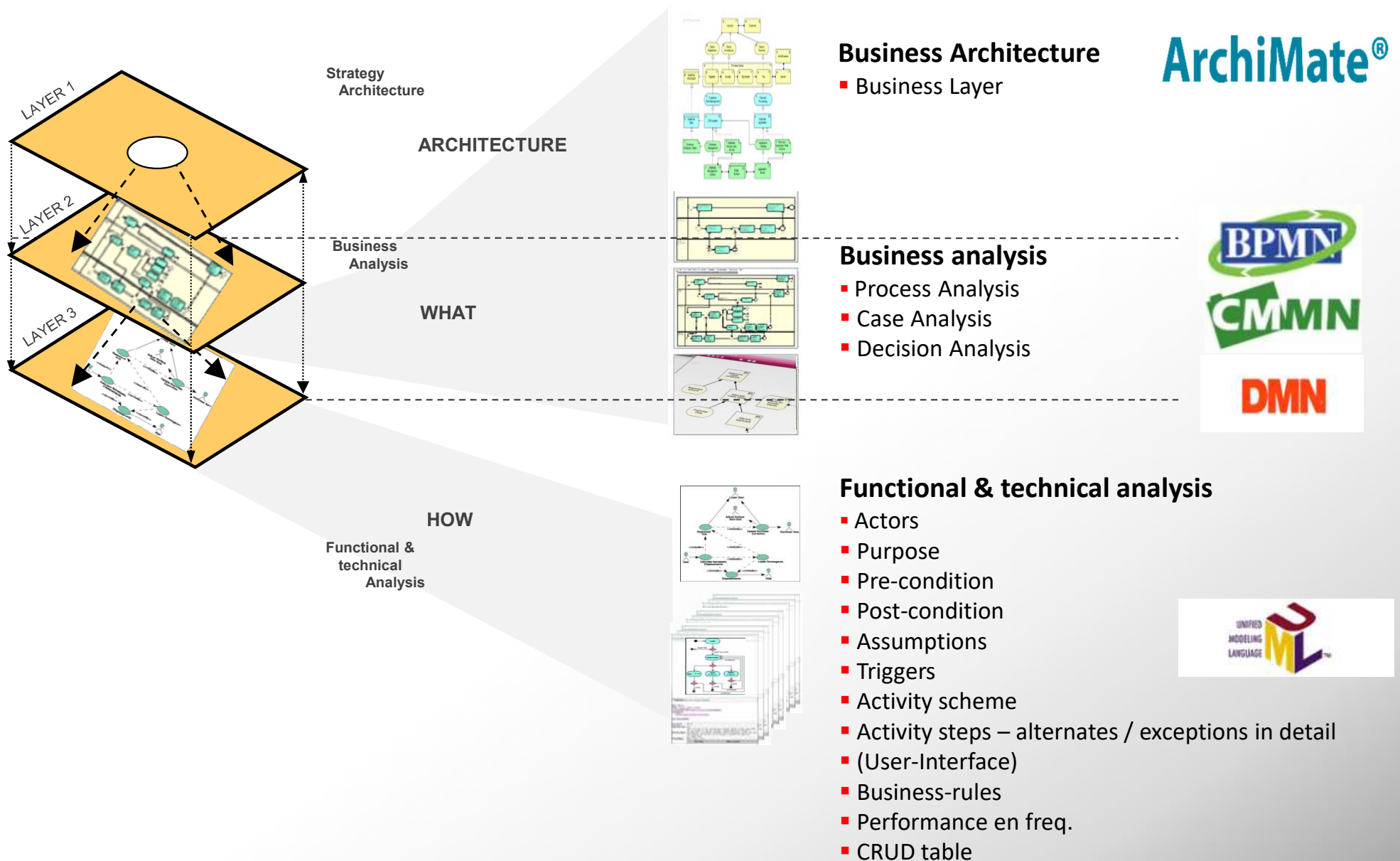
Provides a detailed model of the underlying applications supporting business processes.

By?

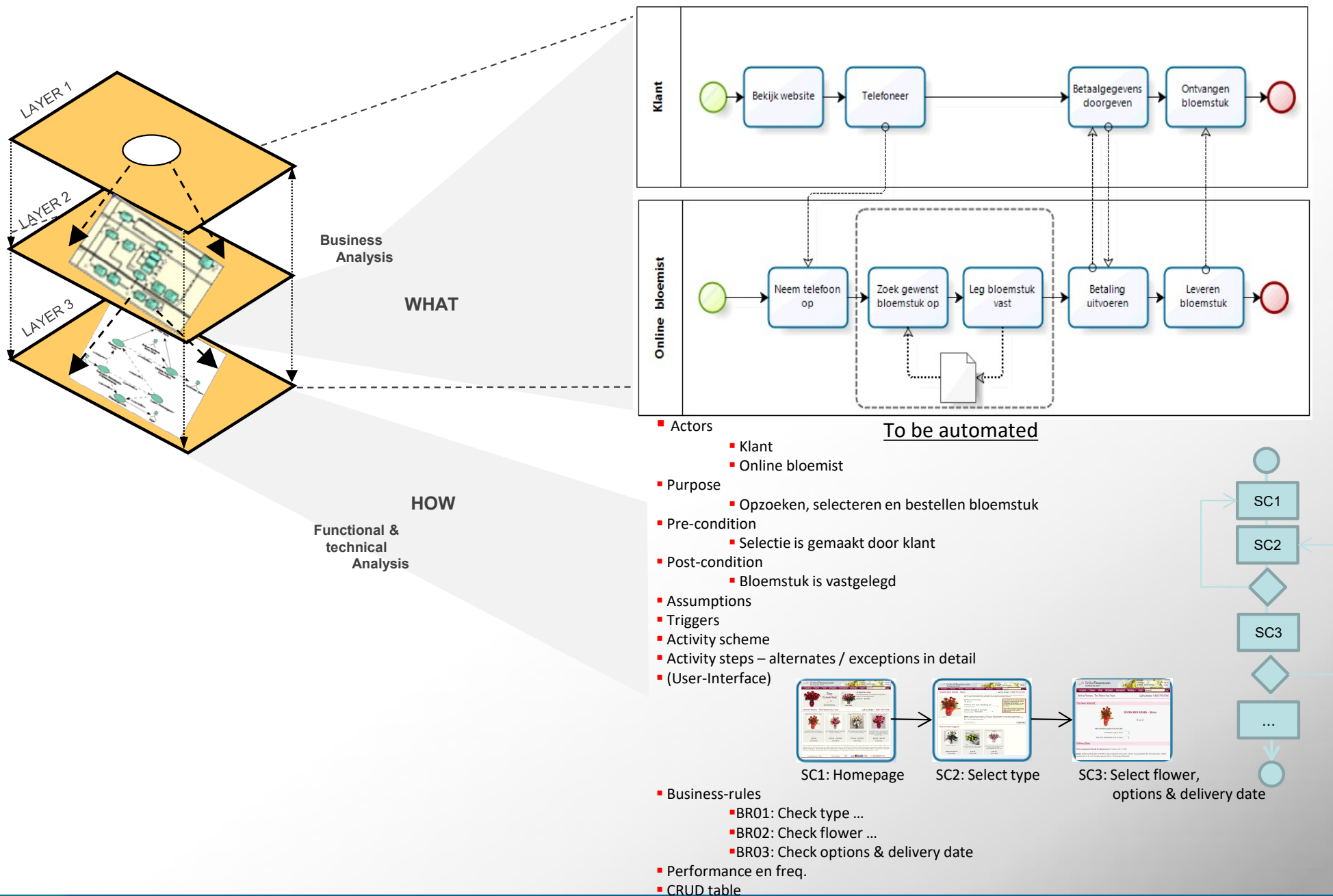
Business managers / IT managers / Key Persons.



Business Analysis versus Functional Analysis



Business Analysis versus Functional Analysis – an example



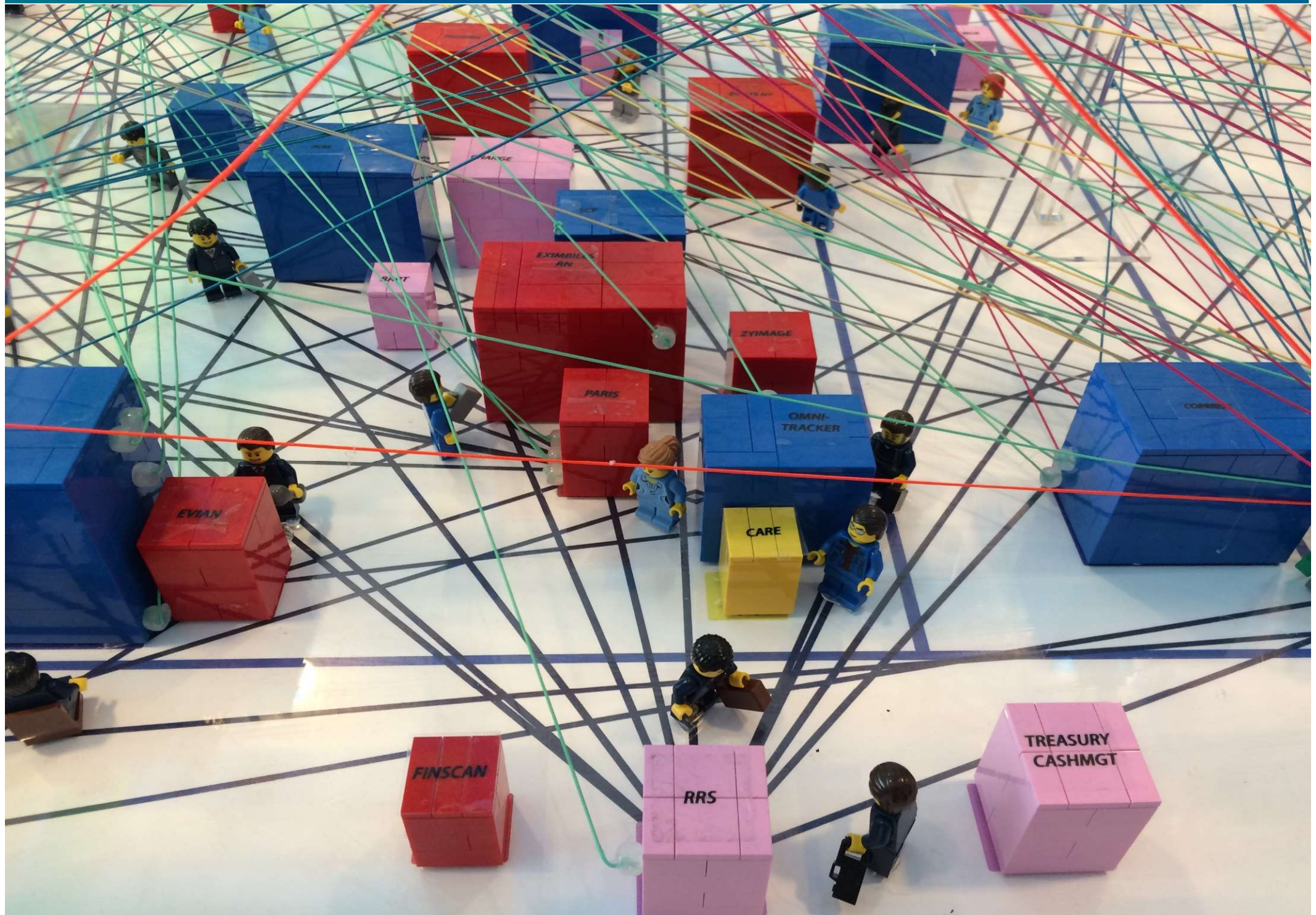
3D ENTERPRISE BLUEPRINTING FRAMEWORK



3D ENTERPRISE BLUEPRINTING FRAMEWORK



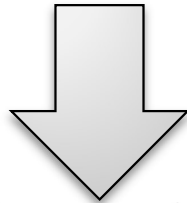
3D ENTERPRISE BLUEPRINTING FRAMEWORK



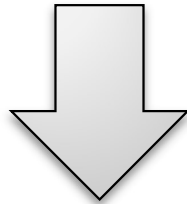
The introduction and purpose of Business Blueprinting

A method that creates visibility and traceability through your organization.

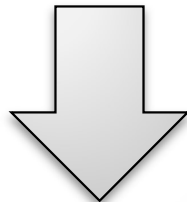
- Business Vision & Strategies (or change in Vision & Strategy)



- Company (companies) processes



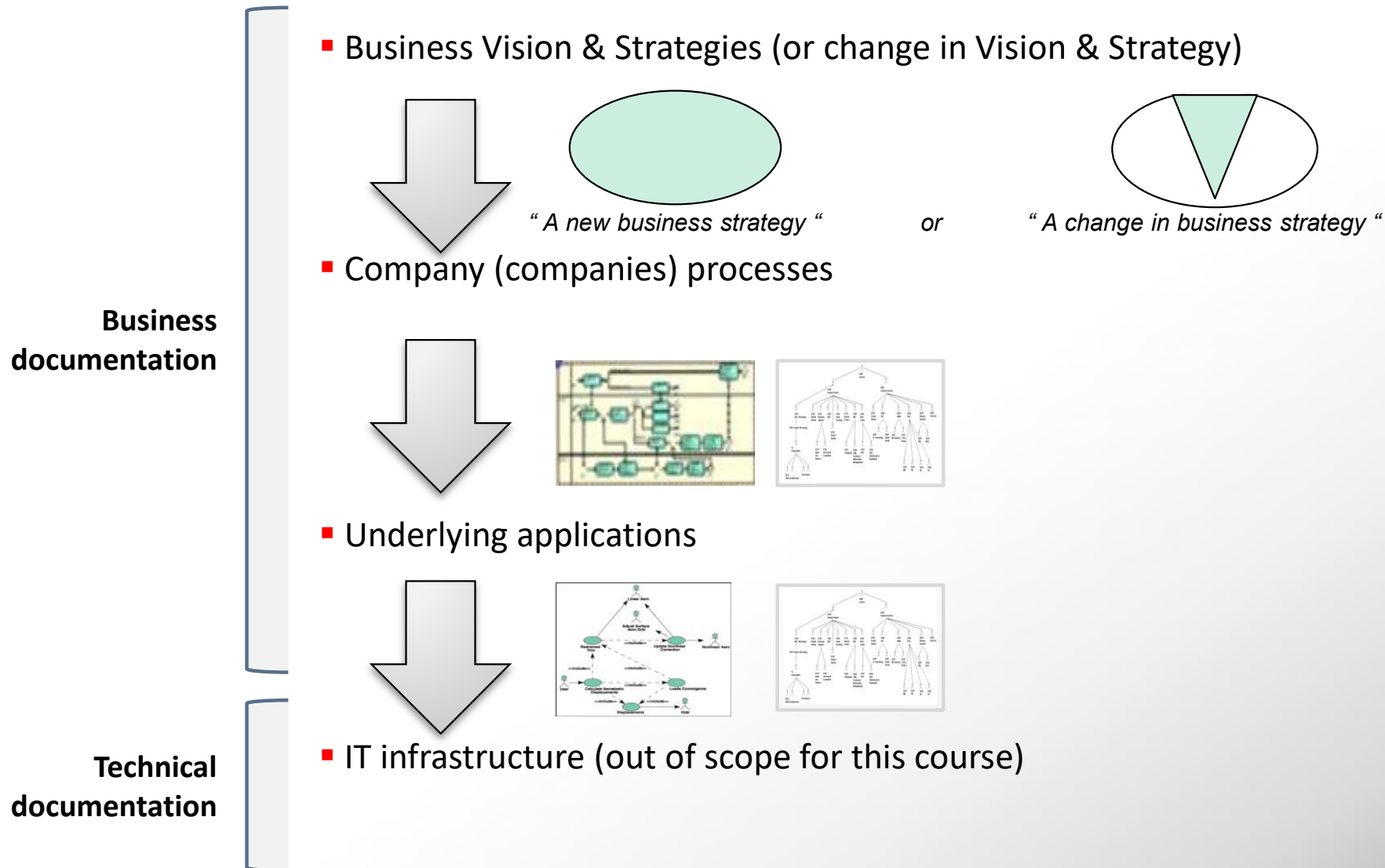
- Underlying applications



- IT infrastructure (out of scope for this course)

The introduction and purpose of Business Blueprinting

A method that creates visibility and traceability through your organization.

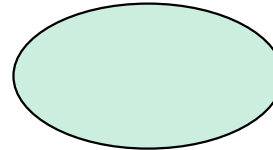


The Business Blueprint - The guidelines and deliverables.

"A new business strategy"

or

"A change in business strategy"



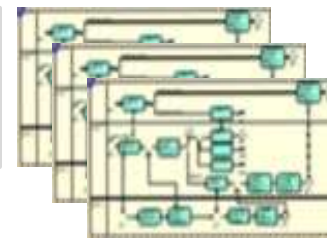
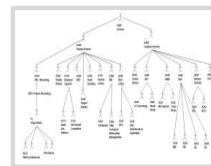
"Guidelines" how to describe the High Level processes

- The syntax
- The versions
- The locations
- The styleguide



"Deliverables" we should get

- Definition of the actors and roles
- Definition of the lexicon
- The proces map
- High Level processes



"High Level processes descriptions"

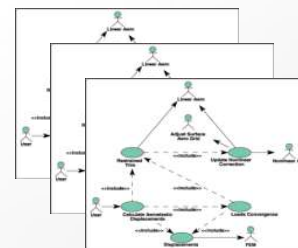
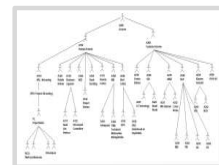
"Guidelines" how to describe the Low Level processes

- The syntax
- The versions
- The locations
- The styleguide

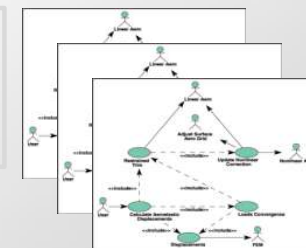
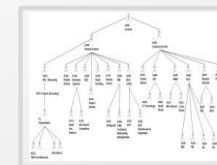


"Deliverables" we should get

- (Definition of the actors)
- (Definition of the lexicon)
- Low Level processes



"Low Level process descriptions"



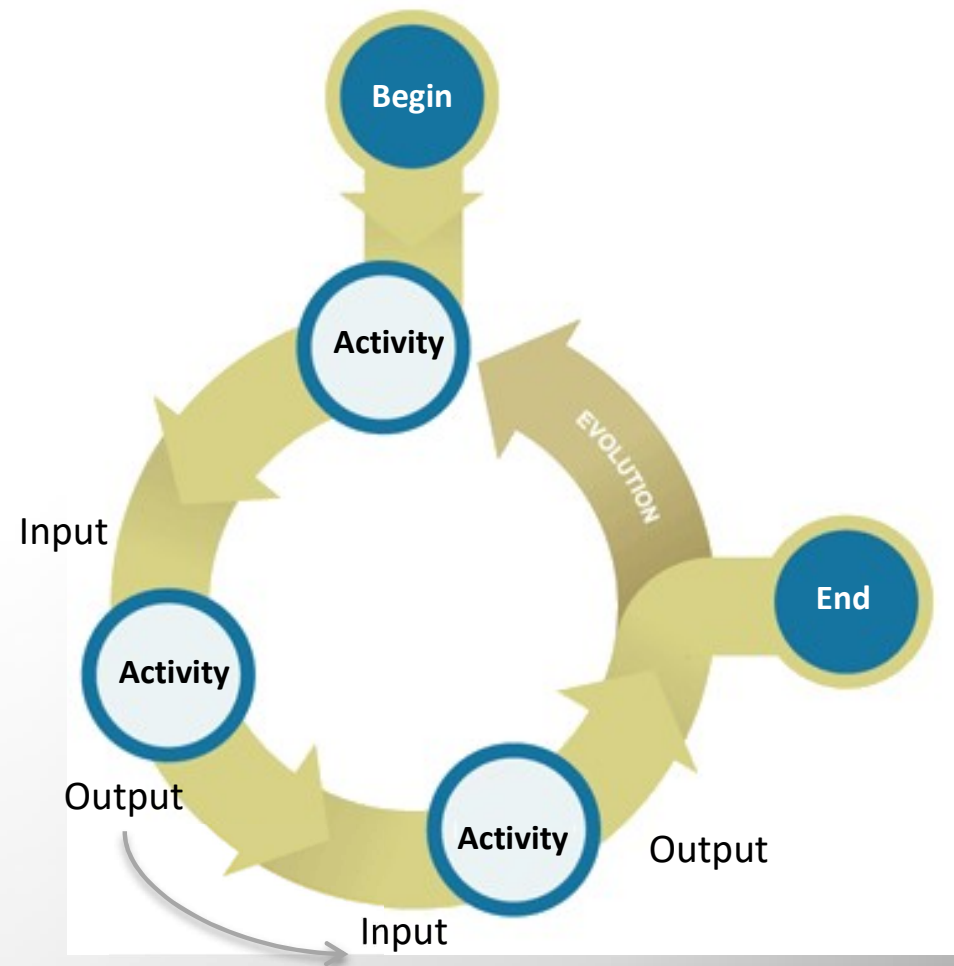
"Low Level process descriptions"

Definition of a process

A process is;

A specific **ordering of work activities** sequential or parallel which results in

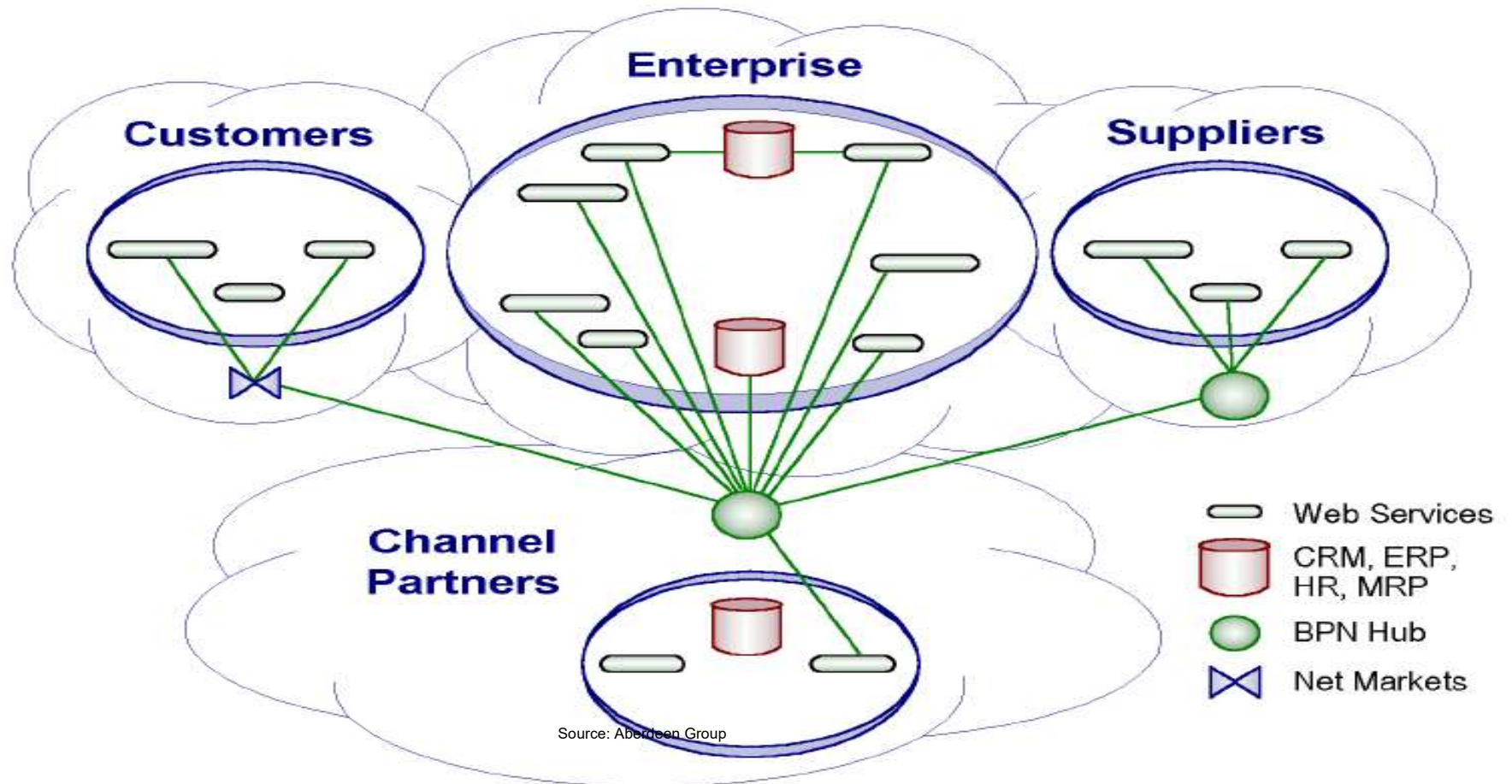
transformation that **creates value across time** (continue / wait for) and **place** with a **beginning** (trigger) an **end** and clearly defined **inputs** and **outputs** to achieve a defined **business outcome**



Definition of a process

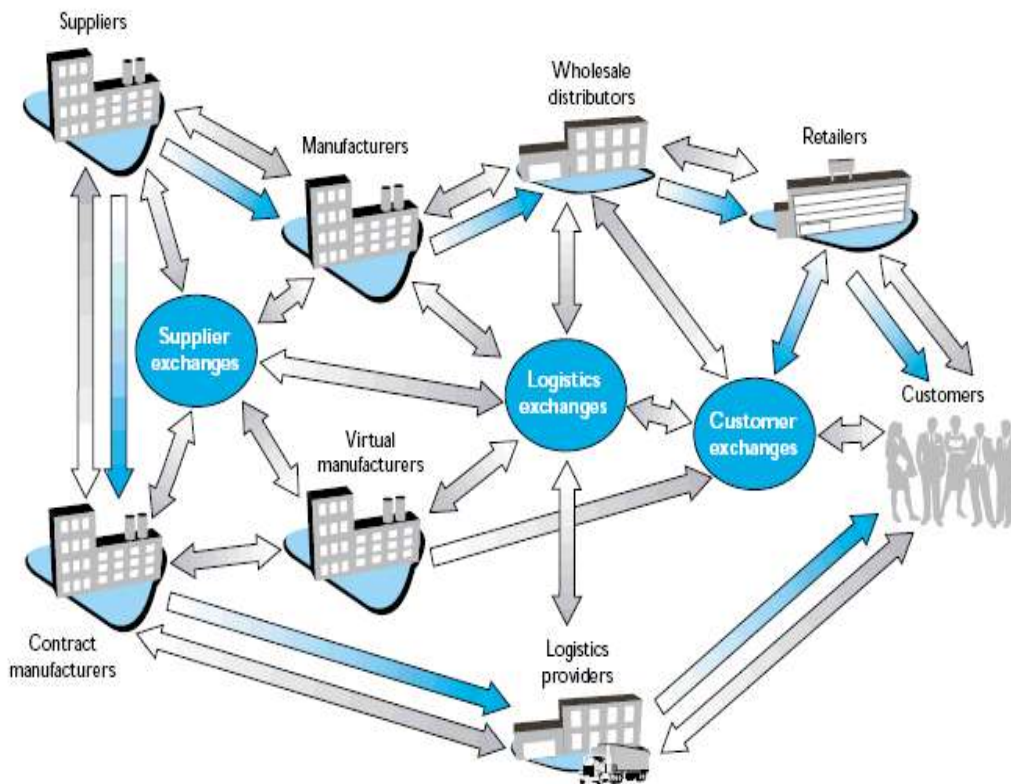
Business processes are both **internal** and **external** to autonomous business entities, they are **End-to-End** and drive their collaboration to achieve shared business goals by enabling highly fluid **process networks**.

The New Business Ecosystem – Driven by Process Connectivity

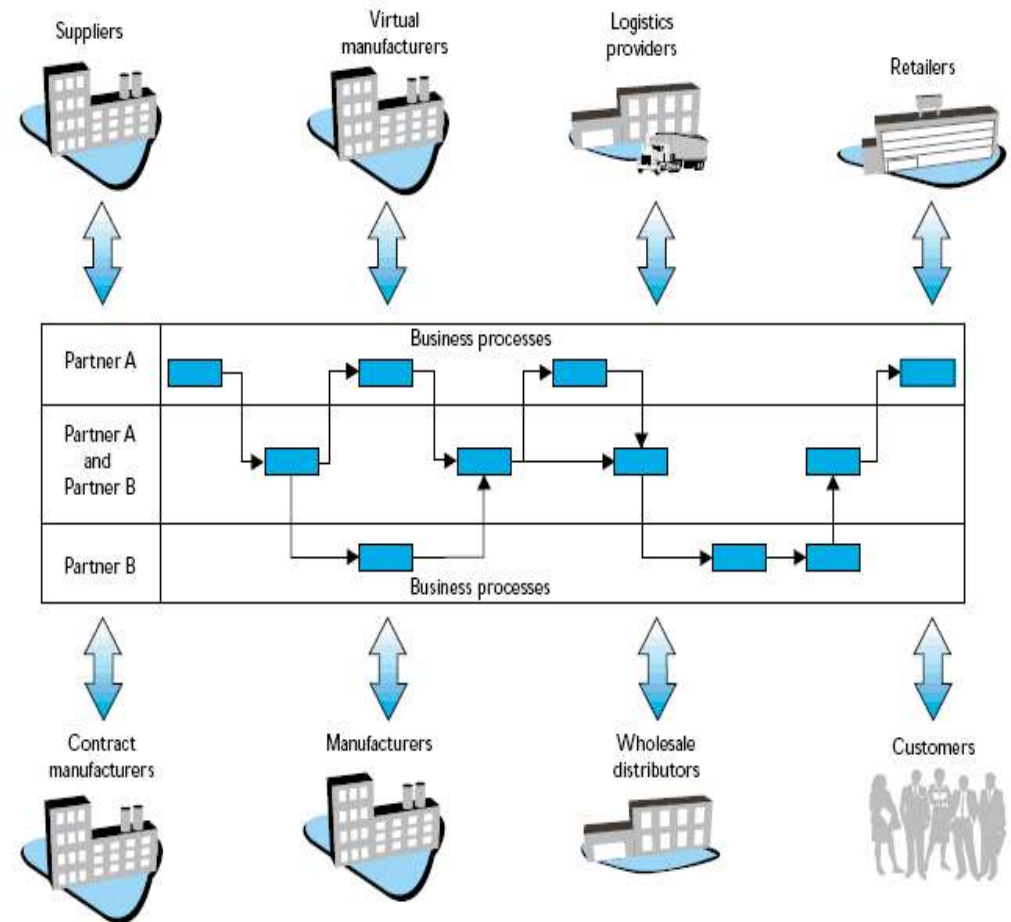


Business Process Management is top down, and model driven

- Process design is **independent** of technical deployment
- High level models of the business can be **incrementally refined** by further modeling



Before Process Management



After Process Management

What is ...

BPMN - Business process Modeling Notation

It is the new standard for **modeling business processes** and web service processes, as put forth by the Business Process Management Initiative (BPMI – **BPMI.org**).

The primary goal of the BPMN effort was to provide a notation that is readily **understandable by all business users**, from the business analysts that create the initial drafts of the processes, to the technical developers responsible for implementing the technology that will perform those processes, and finally, to the business people who will manage and monitor those processes.



OMG vs. BPMI.org

BPMI and OMG established to promote the use of Business Process Management. They create standards for process design & deployment.



← MERGED in 2005 →



OMG vs ISO



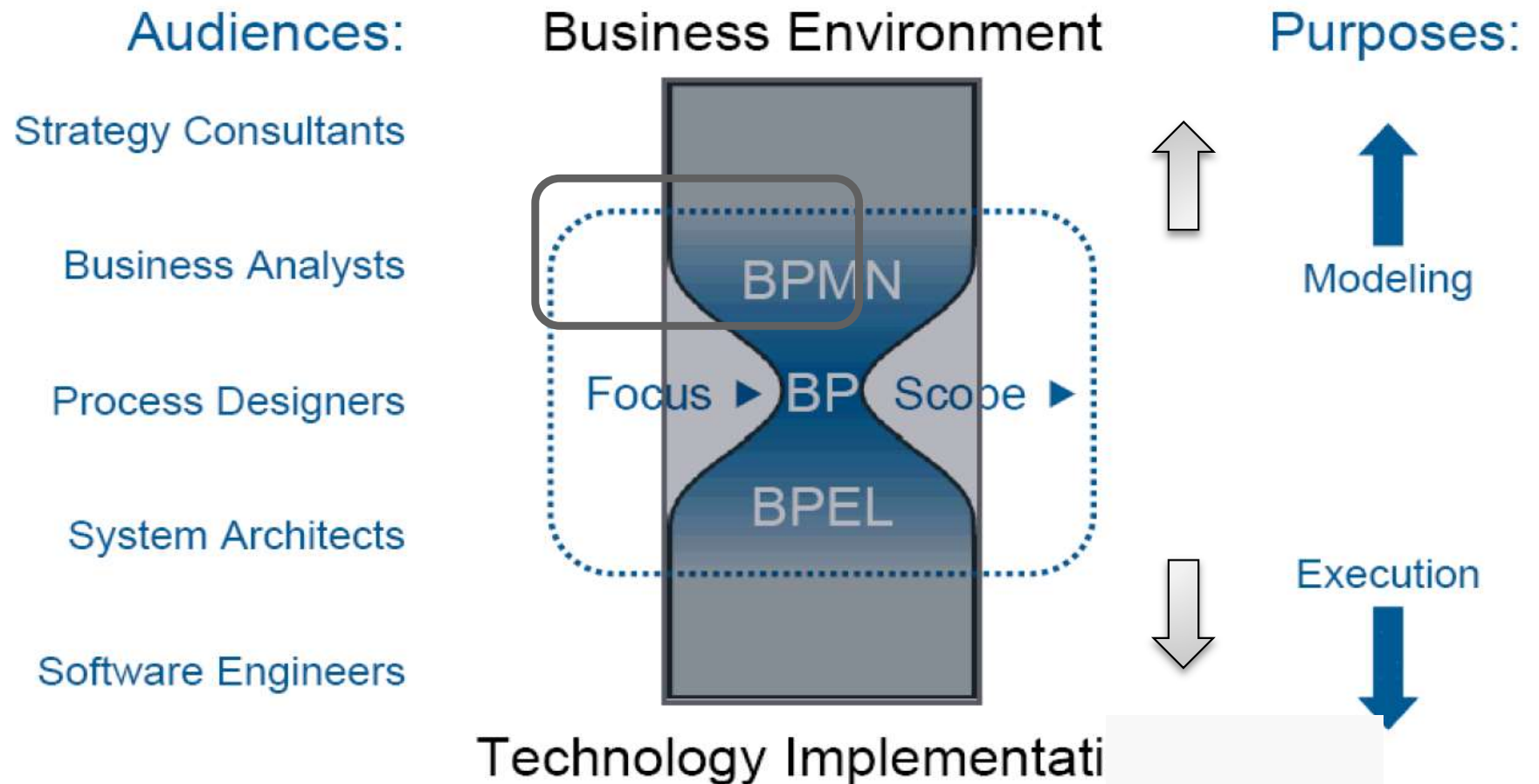
ISO/IEC 19510:2013 is identical to **OMG BPMN 2.0.1**

http://www.iso.org/iso/catalogue_detail.htm?csnumber=62652

What is ...

BPMN - Positioning

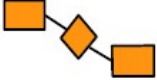
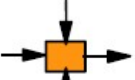
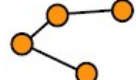
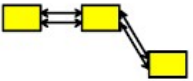
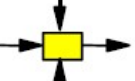
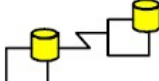
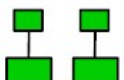
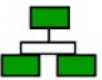
BPMN is positioning itself as a high-level bridge between business and IT.



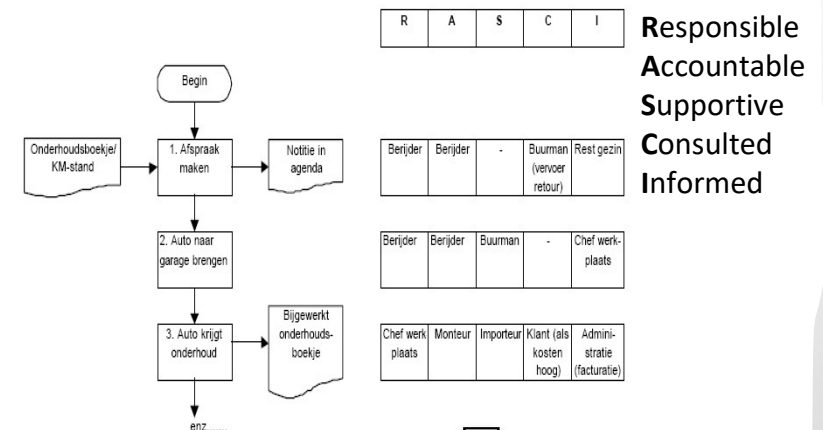
Copyright © 2005, OMG

What is ...

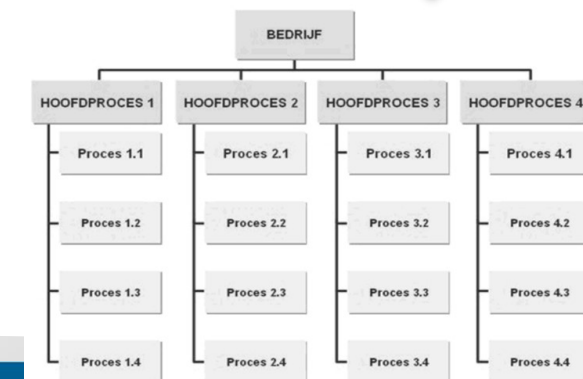
In Zachman - Not in BPMN – Define the list of processes

	DATA <i>What</i>	FUNCTION <i>How</i>	NETWORK <i>Where</i>	PEOPLE
SCOPE (CONTEXTUAL)	List of Things to the  Entity = Class Business	List of Processes Business  Function = Class Business	List of Locations in the Business  Node = Major Location	List of Imp
ENTERPRIS MODEL (CONCEPTUAL)	e.g. Semantic  Ent = Business Rein = Business	e.g. Business Process  Proc. = Business I/O = Business	e.g. Business  Node = Business Link = Business	
SYSTEM MODEL (LOGICAL)	e.g. Logical Data  Ent = Data Rein = Data	e.g. Application  Proc. = Application I/O = User	e.g. Distributed Architectur  Node = I/S (Processor Storage) Link = Line	
TECHNOLOG MODEL (PHYSICAL)	e.g. Physical Data  Ent = Rein =	e.g. System  Proc. = Computer I/O = Data	e.g. Technology  Node = Link = Lin	
DETAILE REPRESN (OUT-OF-)	e.g. Data  Ent = Rein =	e.g.  Proc. = Language I/O = Control	e.g. N	
FUNCTIONIN ENTERPRIS	e.g.	e.g.		

The identification of the processes inside a company can be executed by a method sa. the RA(S)CI method



This gives a list of processes



What is ...

Not in BPMN – Define the list of (hierarchy) processes

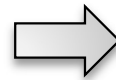
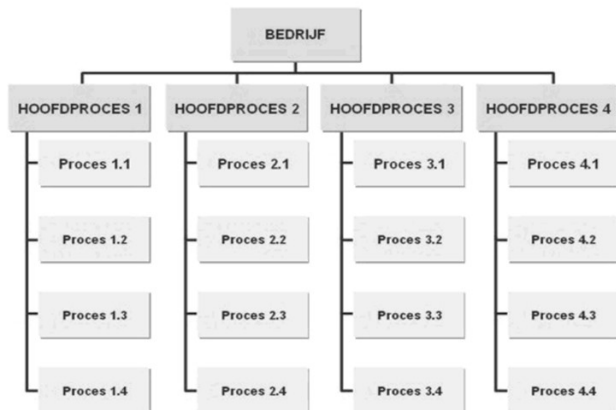
ProcesCluster

- Proces 01
- Proces 02
- ...

Proces

- Subproces 01
- Subproces 02
- ...

The identification of the processes can be described in **MS Excel**.

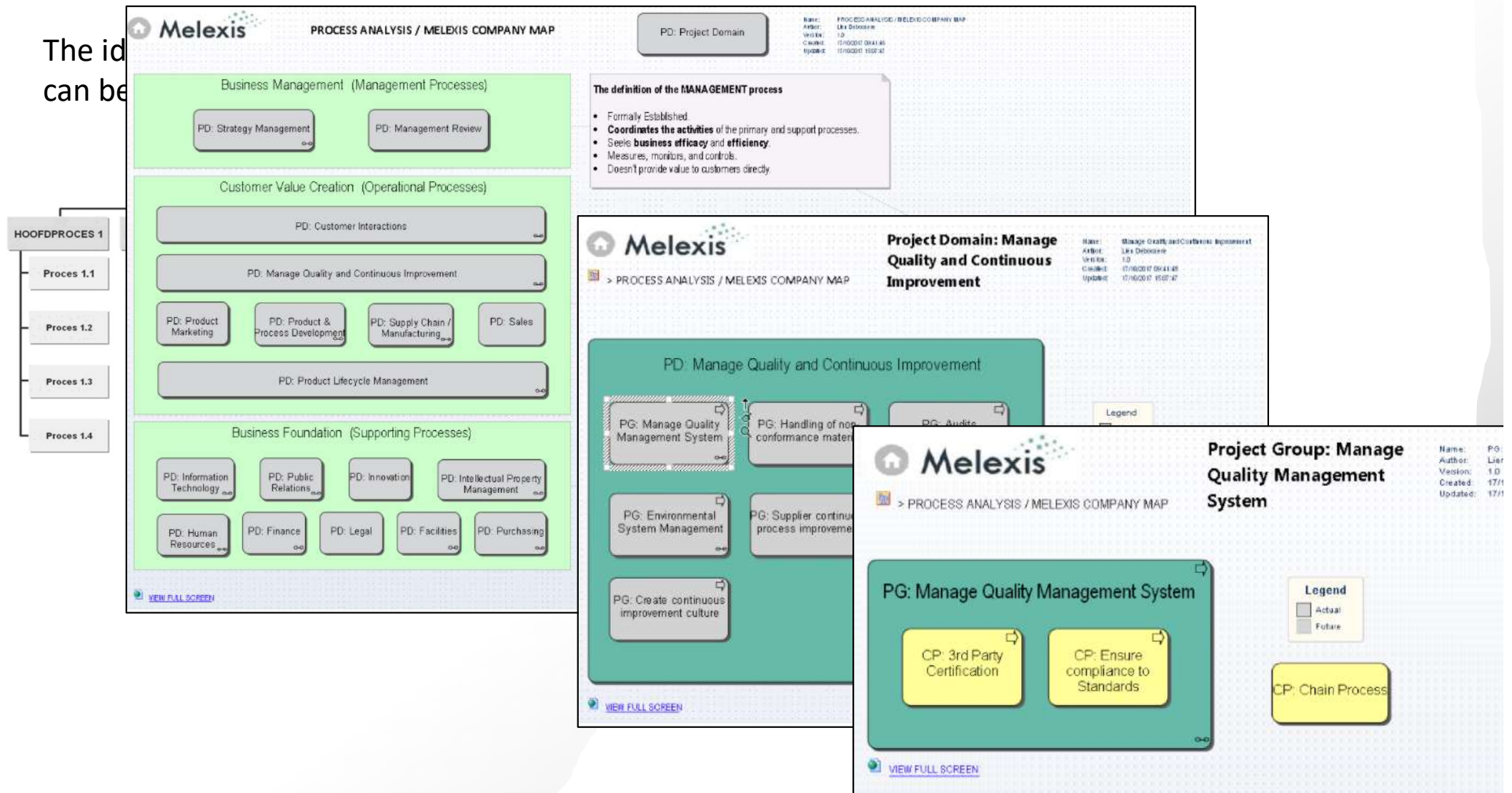


1	1. Produceren van water
2	1.1. Bepalen beleid van de productie van water
54	1.2. Ontwerpen en plannen van de productie van water
106	1.3. Realiseren van de productie van water
134	1.4. Opvolgen van de productie van water
162	2. Aanvoeren en opslaan van water
163	2.1. Bepalen beleid van de aanvoer en opslag van water
215	2.2. Ontwerpen en plannen van de aanvoer en opslag van water
267	2.3. Realiseren van de aanvoer en opslag van water
295	2.4. Opvolgen van de aanvoer en opslag van water
323	3. Verdelen van water
324	3.1. Bepalen beleid van de distributie van water
376	3.2. Ontwerpen en plannen van de distributie van water
428	3.3. Realiseren van de distributie van water
456	3.4. Opvolgen van de distributie van water
484	4. Verkopen van water en diensten
485	4.1. Bepalen beleid van de verkoop van water en diensten
537	4.2. Plannen en realiseren van de verkoop van water en diensten
589	4.3. Opvolgen van de verkoop van water en diensten
617	5. Ondersteunen en aansturen
618	5.1. Bepalen beleid
670	5.2. Beheren van logistiek
722	5.3. HRM
750	5.4. Boekhouden en budgetteren
802	5.5. ICT
803	5.5.1. Selecteren van behoeften
804	Input/Trigger: behoeften van afdelingen en/of opportuniteiten
806	5.5.1.1. Verzamelen van behoeften
808	5.5.1.2. Verwerken van behoeften
810	5.5.1.3. Prioriteiten bepalen
812	5.5.1.4. ICT-plan opmaken
814	5.5.1.5. Plan laten goedkeuren door de raad van bestuur
818	Output: ICTplan is beschikbaar
820	5.5.2. ICT-projecten initiëren
821	Input/Trigger: beschikbaar informaticaplan
823	5.5.2.1. Analyse
825	5.5.2.2. Bestek opmaken
827	5.5.2.3. Aanbesteding uitschrijven
829	5.5.2.4. Offertes vergelijken en keuze maken
831	5.5.2.5. Voorstel naar rvb
833	5.5.2.6. Bestelling plaatsen
835	Output: project besteld aan leverancier

What is ...

Not in BPMN – Define the list of (hierarchy) processes

The id
can be



What is ...

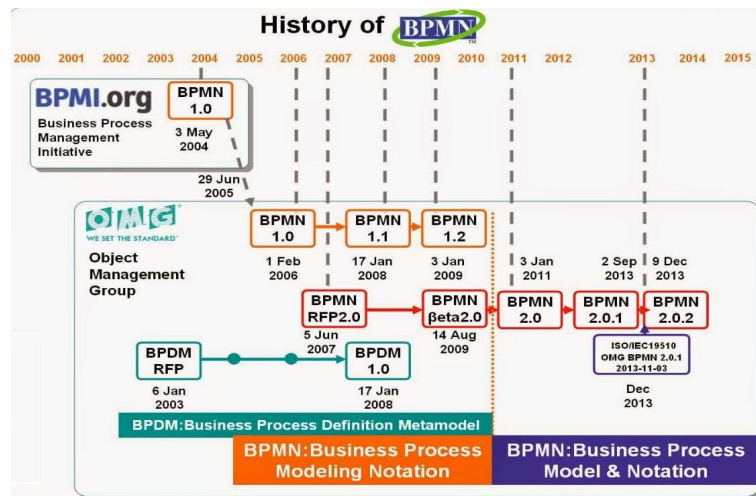
About BPMN – The History

(1) BPMN 1.0 - This specification was released to the public in May 2004. This specification represents more than two years of effort by the BPMI Notation Working Group.

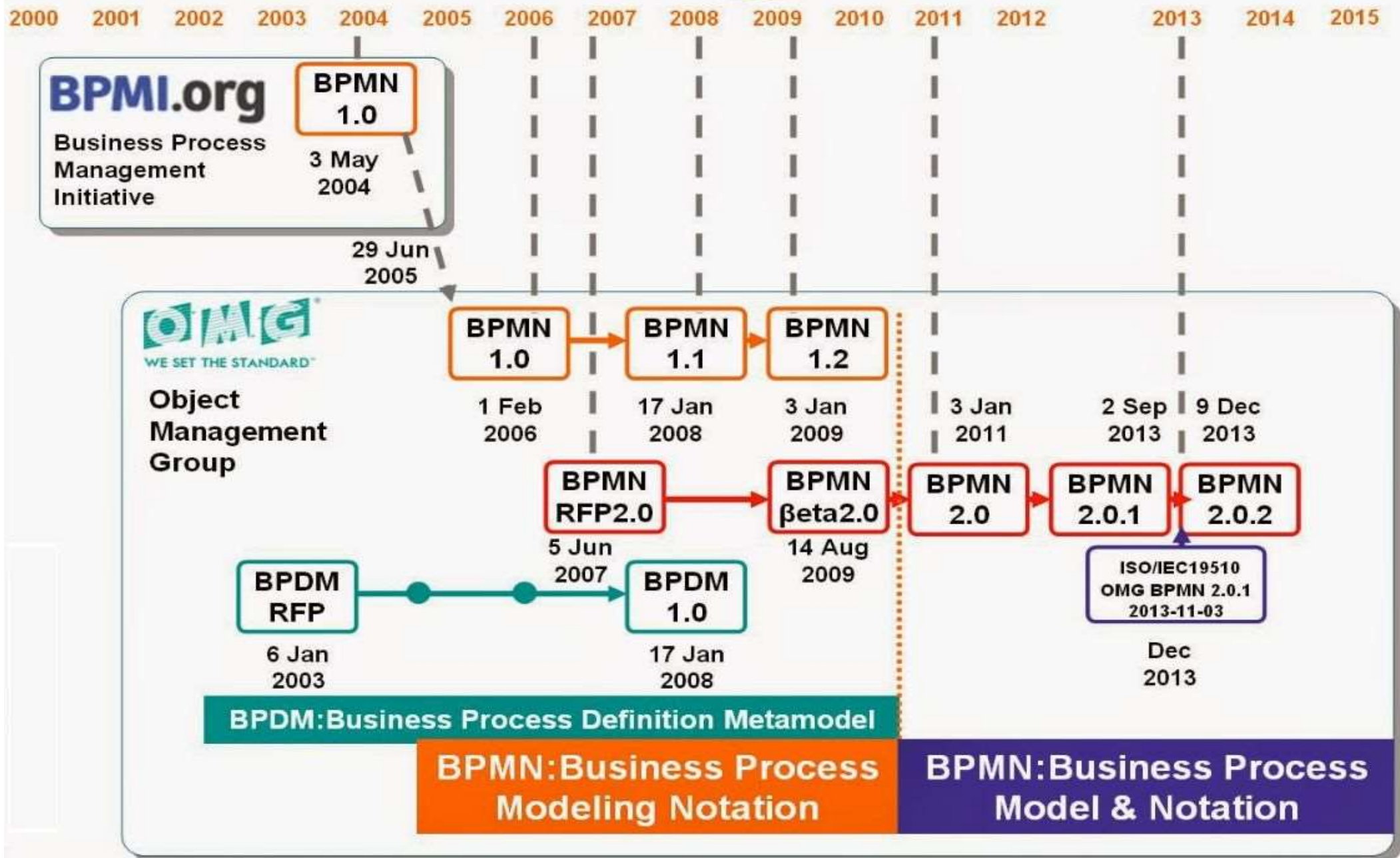
(2&3) Adopted BPMN 1.0 and BPMN 1.1 - These versions replaces the submission document and the draft adopted specification. It is an OMG Final Adopted Specification, which has been approved by the OMG board and technical plenaries.

(4) BPMN 2.0 - These version was released in june 2010.

(5) BPMN 2.x - These version will be released in 202x.



History of



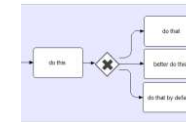
What is ...



XPDL 2.X / XML Process Definition Language

Standard from the

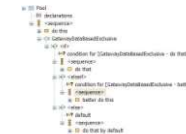
Workflow
Management
Coalition



BPMN



XPDL



The 'XML Process Definition Language' (XPDL) is a format standardized by the Workflow Management Coalition (WfMC) to interchange business process definitions between different workflow products, i.e. between different modeling tools and management suites.

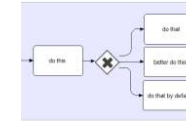
XPDL defines an XML schema for specifying the declarative part of workflow / business process.

In XPDL 2.1 the WfMC introduced the idea of Portability Conformance classes. The major purpose of this introduction was to **make process interchange a reality**.

What is ...



XPDL 2.X / XML Process Definition Language



BPMN



XPDL

```
<?xml version='1.0' encoding='UTF-8'>
<xpdl:process xmlns:xpdl='http://www.institute.be/xpdl' name='do this'>
  <xpdl:task name='do this' type='start' />
  <xpdl:exclusiveGateway name='exclusiveGateway' />
  <xpdl:parallelGateway name='parallelGateway' />
  <xpdl:task name='do that' type='normal' />
  <xpdl:task name='either do this' type='normal' />
  <xpdl:task name='do that by default' type='normal' />
</xpdl:process>
```

Your investment in process modeling is secure

Process analysis can be expensive in terms of consultancy and manpower. It makes sense not to bottle up this information in a proprietary platform or on paper!

The sensible solution is to use a modeler which can export to this industry accepted open standard. Advantage can help you with this security.

Transportability of a process model between modelers

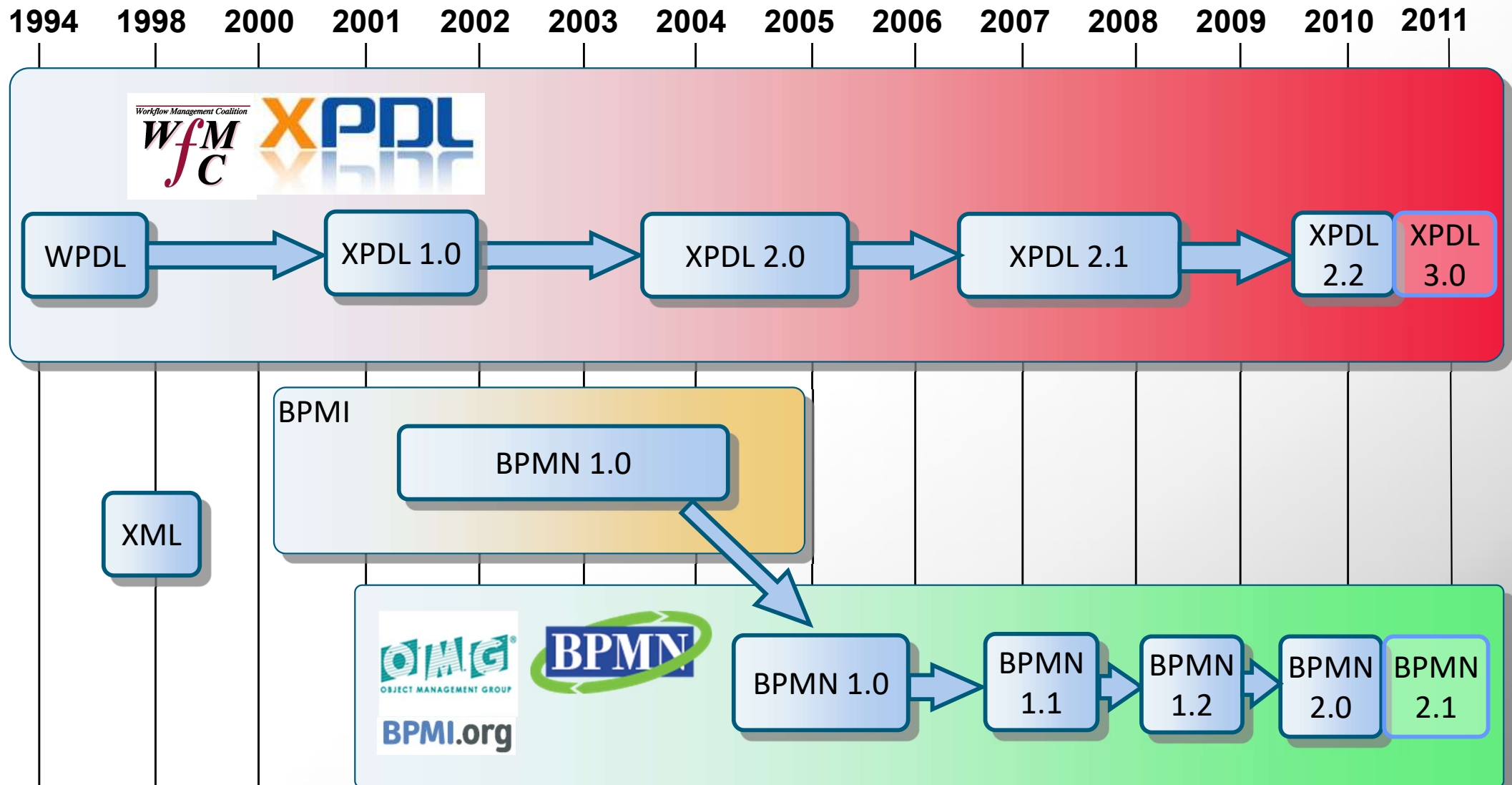
Certain modeling tools may be better at some things than others. For example high end simulation or workflow. It can be useful to move a process model between modelers.

What is ...

<http://www.wfmc.org/xpdl.html>

<http://www.omg.org/bpmn/>

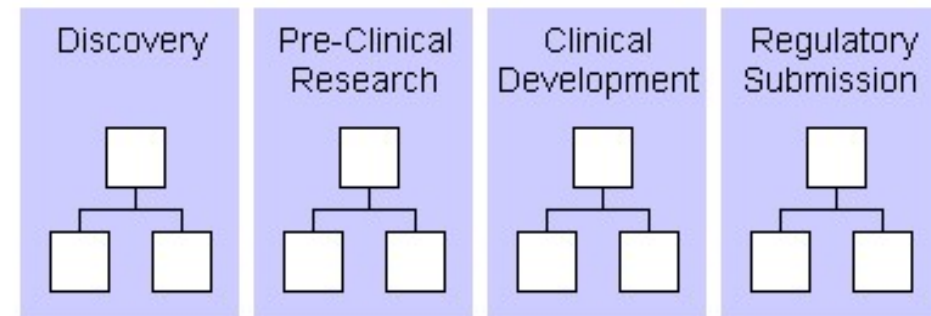
About BPMN – XPDL The History



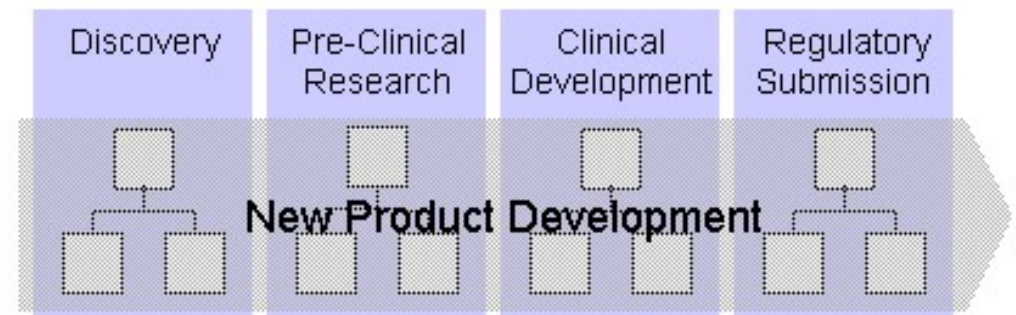
What is ...

BPR – Business Process Re-engineering

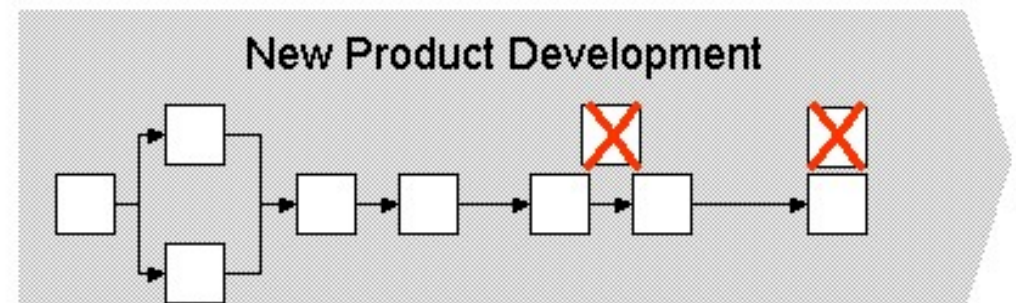
Business process re-engineering (BPR) starts with an **AS-IS**, analysis (in BPMN)



after a **TO-BE** analysis (in BPMN),
Proces organization



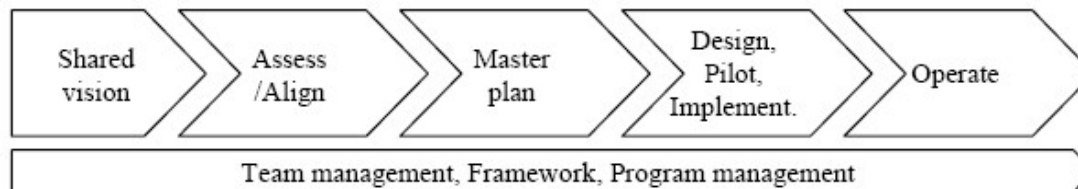
a **TRANSITION** path is defined.



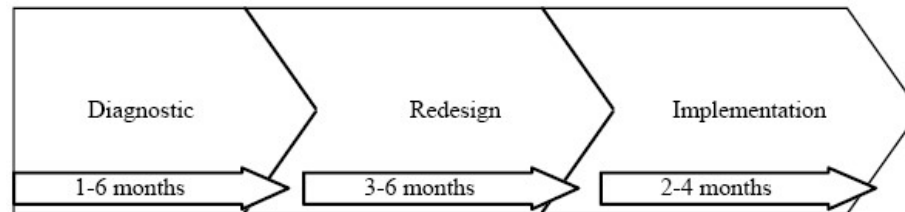
What is ...

BPR – Business Process Re-engineering - from 1 AS-IS -> TO-BE

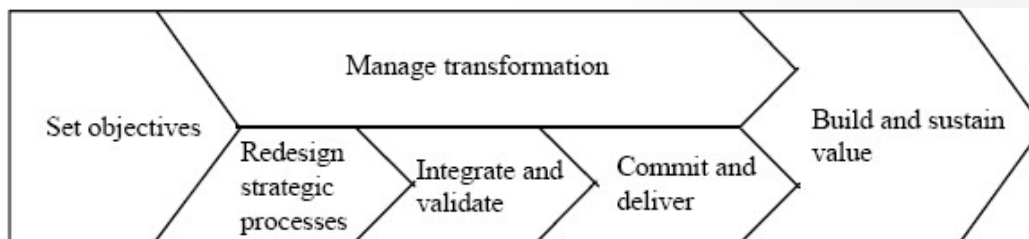
Within the management consulting industry, a significant number of methodological approaches have been developed for the reengineering approach.



Accenture reengineering approach



McKinsey's reengineering approach

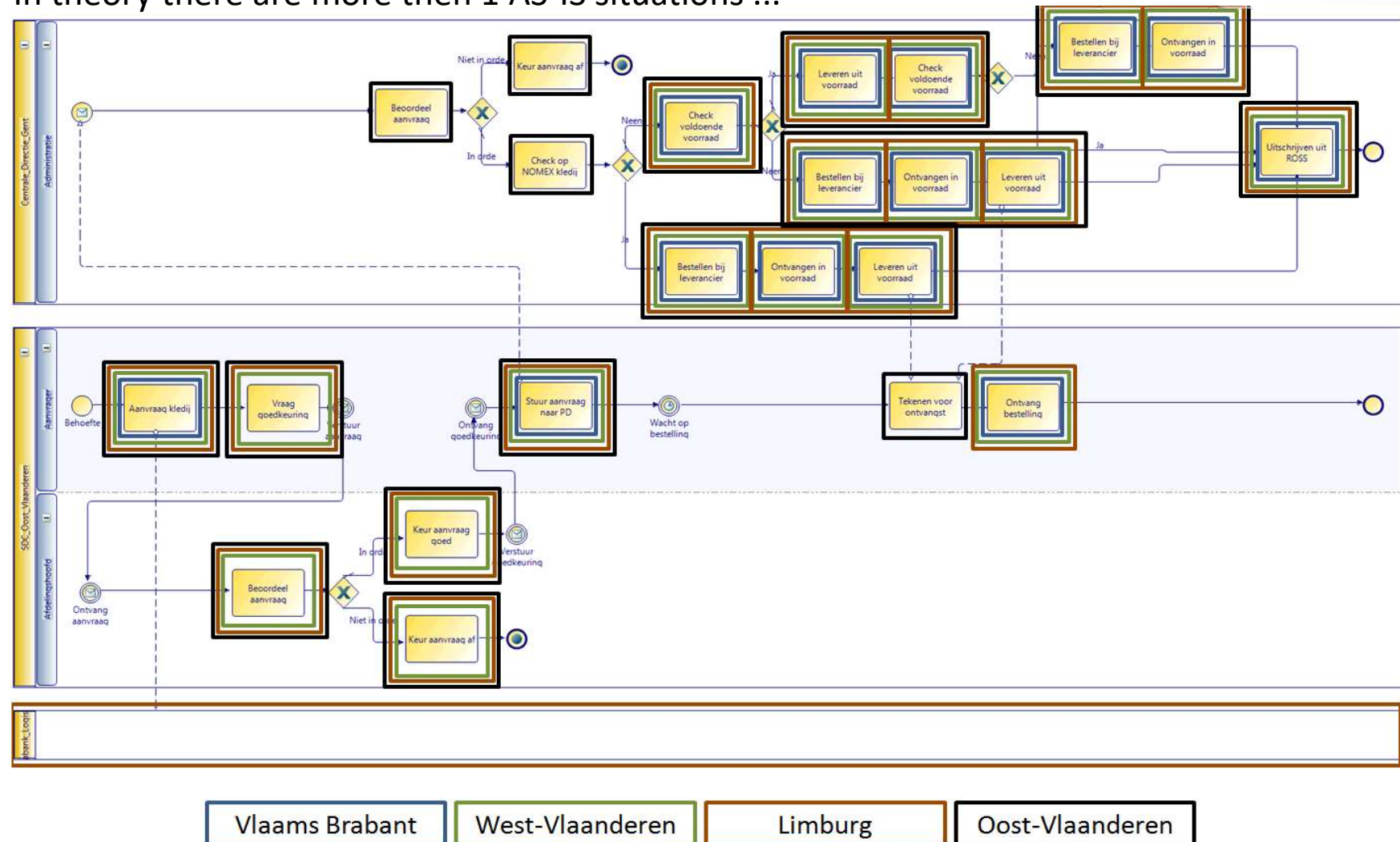


Boston Consulting Group reengineering approach

What is ...

BPR – Business Process Re-engineering - from 4 AS-IS -> TO-BE

In theory there are more than 1 AS-IS situations ...

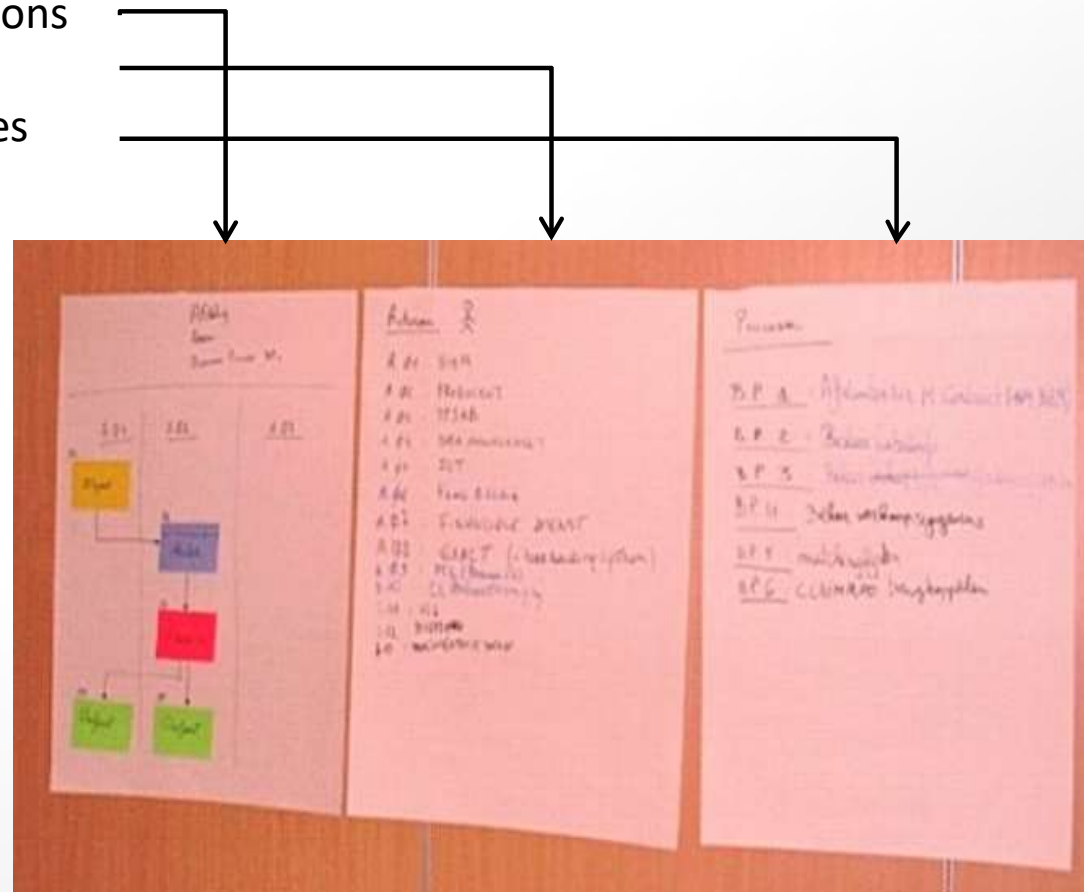


What is ...

Brown-Paper-Workshops

A Brown-paper-Workshop is the ideal tool for information gathering of business process activities.

- 1° Define Post-it colors/actions
- 2° Define Actors
- 3° Define Business Processes



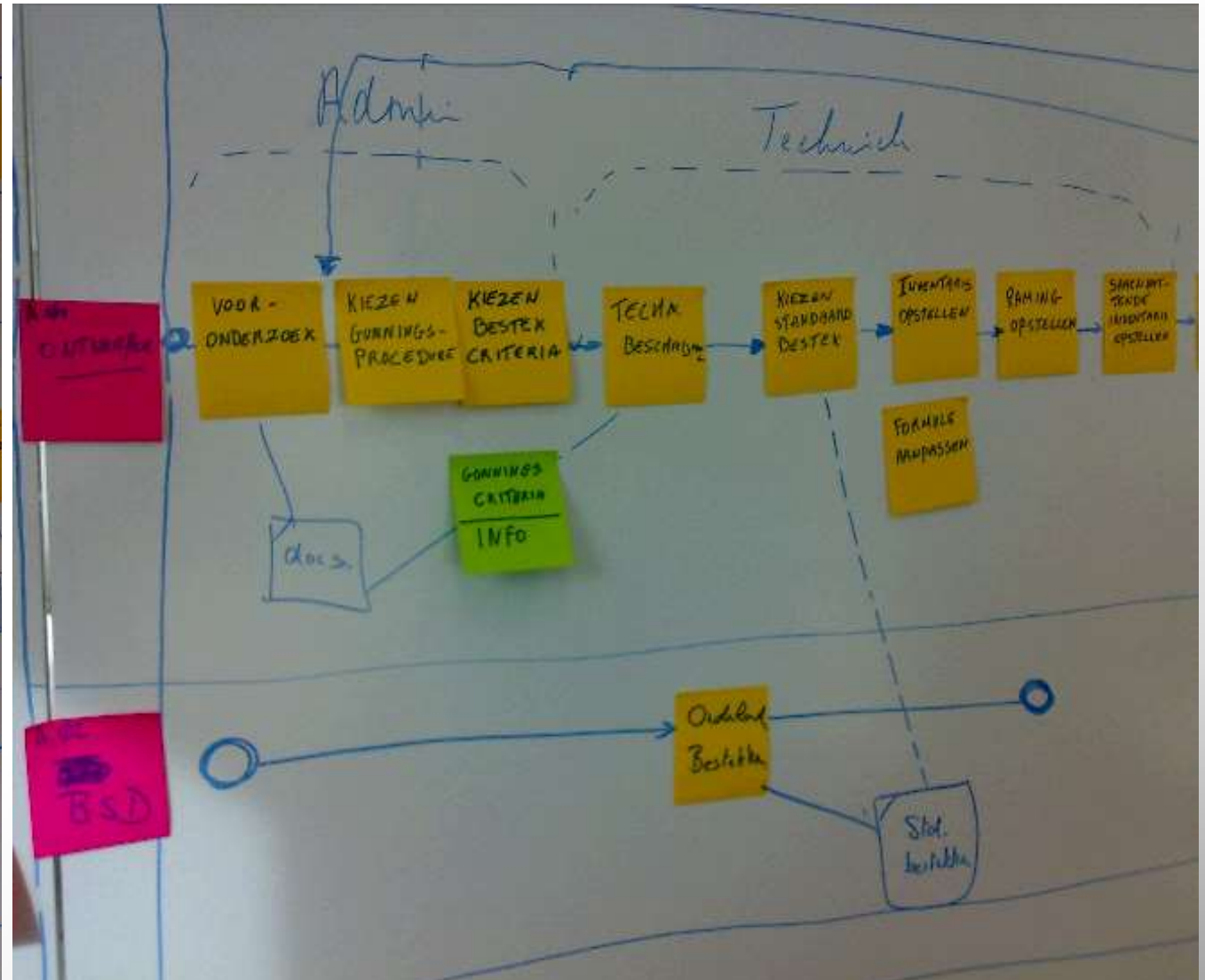
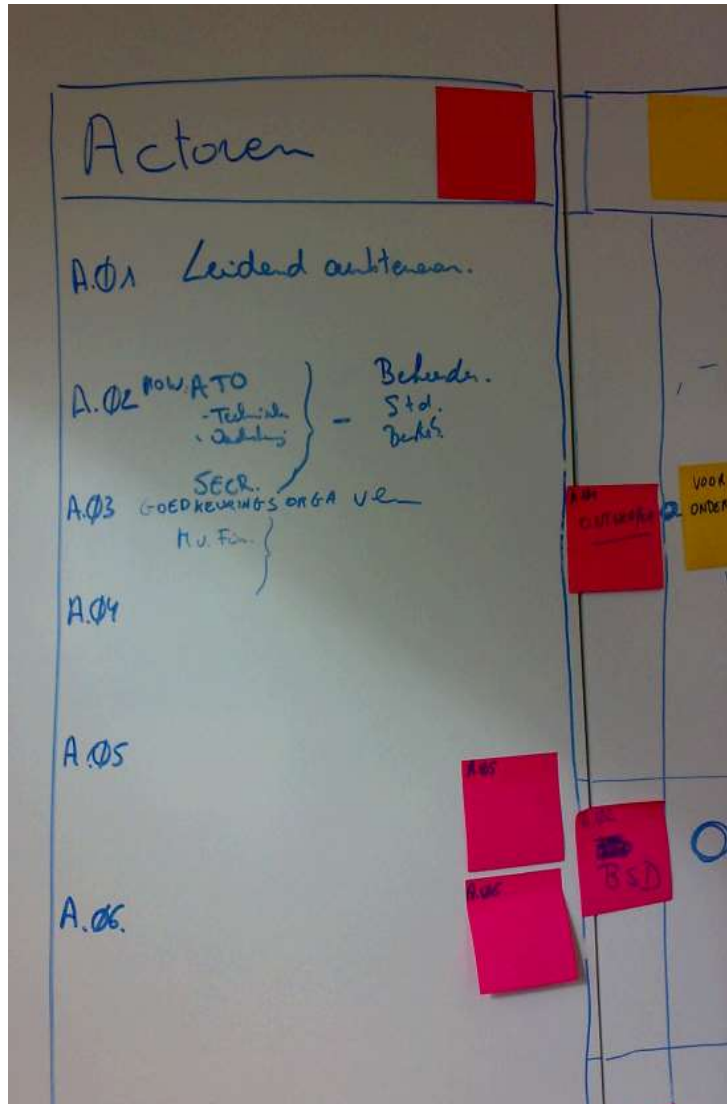
What is ...

Brown-Paper-Workshops on post-its



What is ...

Brown-Paper-Workshops on boards



BPMN versus UML

BPMN provides a number of advantages to modeling business processes over the Unified Modeling Language (UML).



- BPMN is targeted at **business analysts**, system architects, and software engineers. It has been developed as a way to streamline the overall business lifecycle development process from **process design** – performed by a business audience.



- UML is a language that helps **developers** specify, visualize, and document models of **software systems**. It is very much targeted at system architects and software engineers. It has been developed as a means to streamline the software development process, from architecture design to application implementation, for use by a technical audience.

REMARK:

There is a striking similarity between **BPMN** and **UML2 activity diagrams**.

BPMN VS. UML – WHEN TO USE BPMN AND WHEN TO USE UML



Vision & Strategy

- (e)Awareness service
- (e)Transformation Readiness
 - Current State Assessment
 - Gap Analysis & Definition Roadmap
 - Business Case(s) & Planning

Go / No Go

- RFP
- RFP guidance

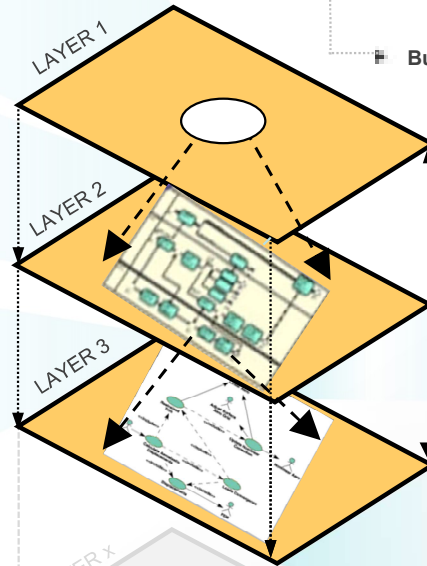
Vision & Strategy

3D ENTERPRISE BLUEPRINTING

Business Analysis

Functional Analysis

Project Lifecycle



Business Analysis

Business Analysis

WHAT

HOW

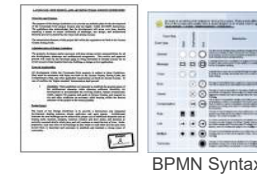
Functional Analysis

Guidelines FA Framework

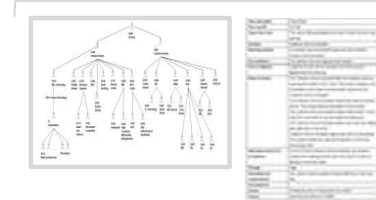


Functional Analysis

Guidelines BA Framework



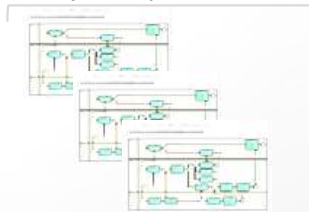
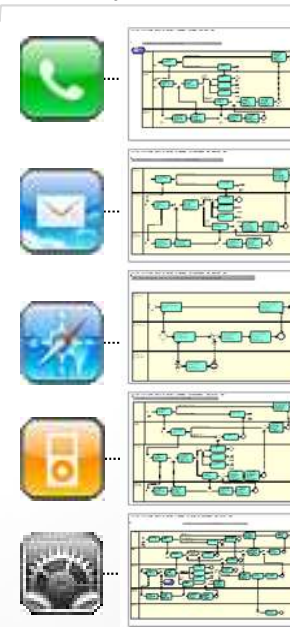
Enterprise Actors



Enterprise Business Processes

Project 'iPhone'

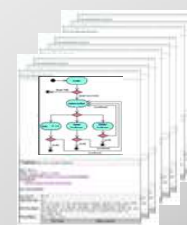
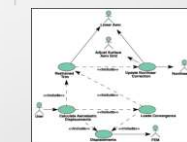
Project 'x, y, z'



Project	Phase	Start	End	Status
Project 'iPhone'	Phase 1	2007-01-01	2007-03-31	Completed
Project 'iPhone'	Phase 2	2007-04-01	2007-06-30	In Progress
Project 'iPhone'	Phase 3	2007-07-01	2007-09-30	Planned
Project 'x, y, z'	Phase 1	2007-10-01	2007-12-31	Planned
Project 'x, y, z'	Phase 2	2008-01-01	2008-03-31	Planned
Project 'x, y, z'	Phase 3	2008-04-01	2008-06-30	Planned

SubProject 'iPhone' A

SubProject 'iPhone' B



- The Business Blueprint
- About BPMN
- Other modeling methods s.a. WfMC, RosettaNet PIPs, UML, DFD, flowcharts...
- The 3 distinct levels of modeling
- The (core) syntax of BPMN
 - Flow Objects
 - Connecting Objects / Connectors
 - Swim lanes
 - Artifacts

About BPMN – What is BPMN?

BPMN stands for **Business Process Modeling Notation**.

BPMN is a core enabler of a new initiative in the Enterprise Architecture world called Business Process Management (BPM). Business Process Management is concerned with managing change to improve business processes.

In the past business processes have been modeled by WfMC Workflow models, RosettaNet PIPs, UML diagrams, DFDs, BPML, ...

More:

<http://www.bpmn.be/>

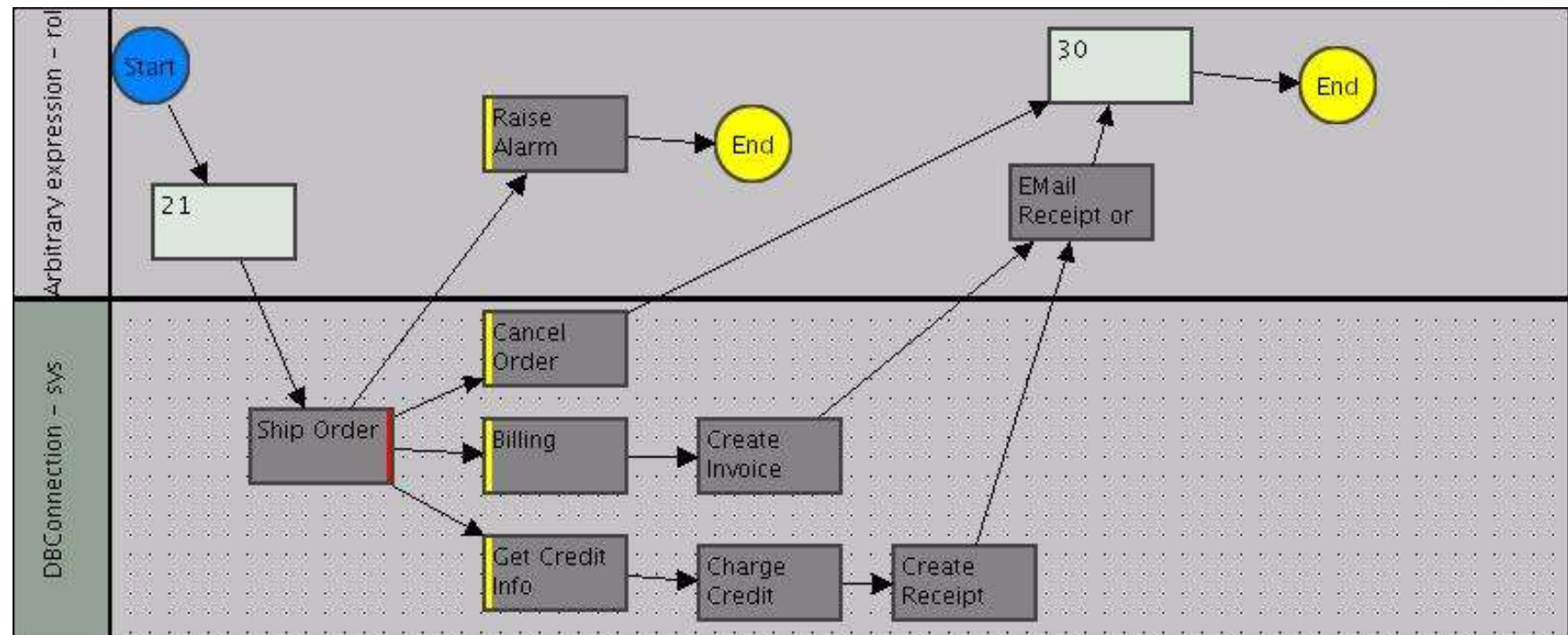


<http://en.wikipedia.org/wiki/BPMN>



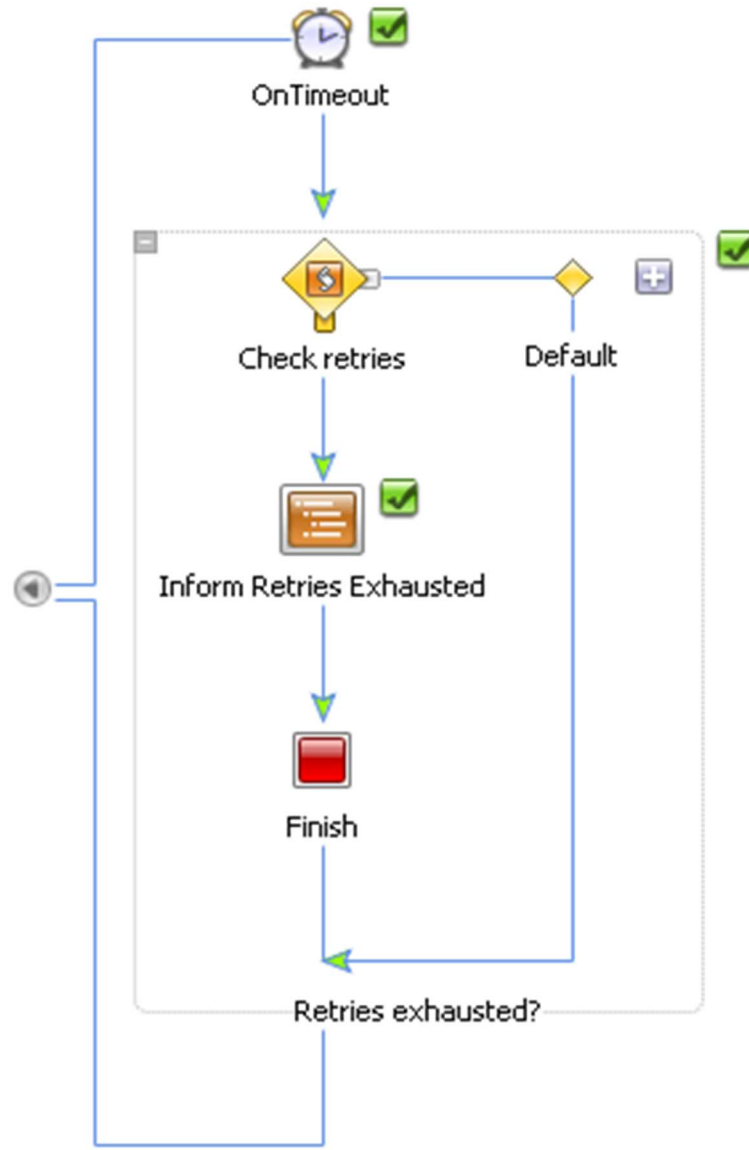
About BPMN – What is BPMN?

Business processes are being / have been modeled by **WfMC Workflow models**.



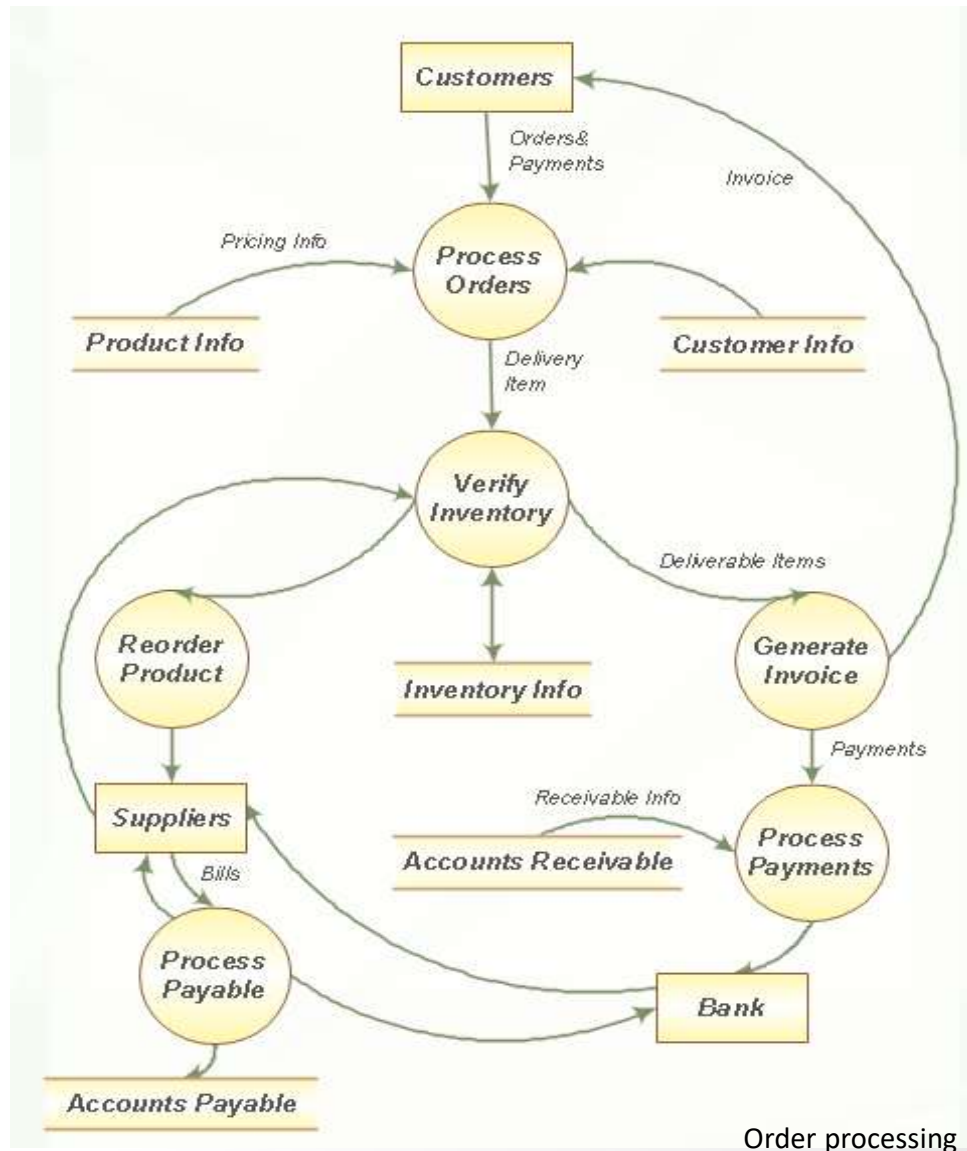
About BPMN – What is BPMN?

Business processes are being / have been modeled by **RosettaNet PIPs**.

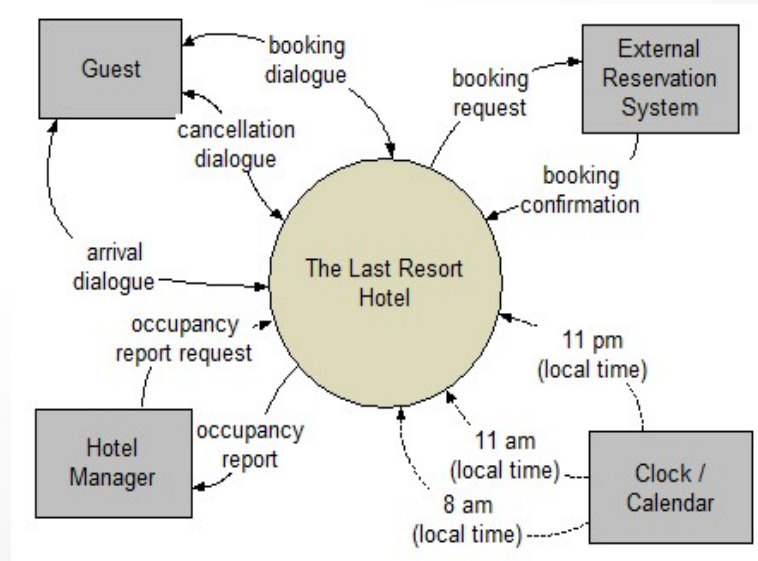


About BPMN – What is BPMN?

Business processes are being / have been modeled by **DFDs - Data Flow Diagrams**.

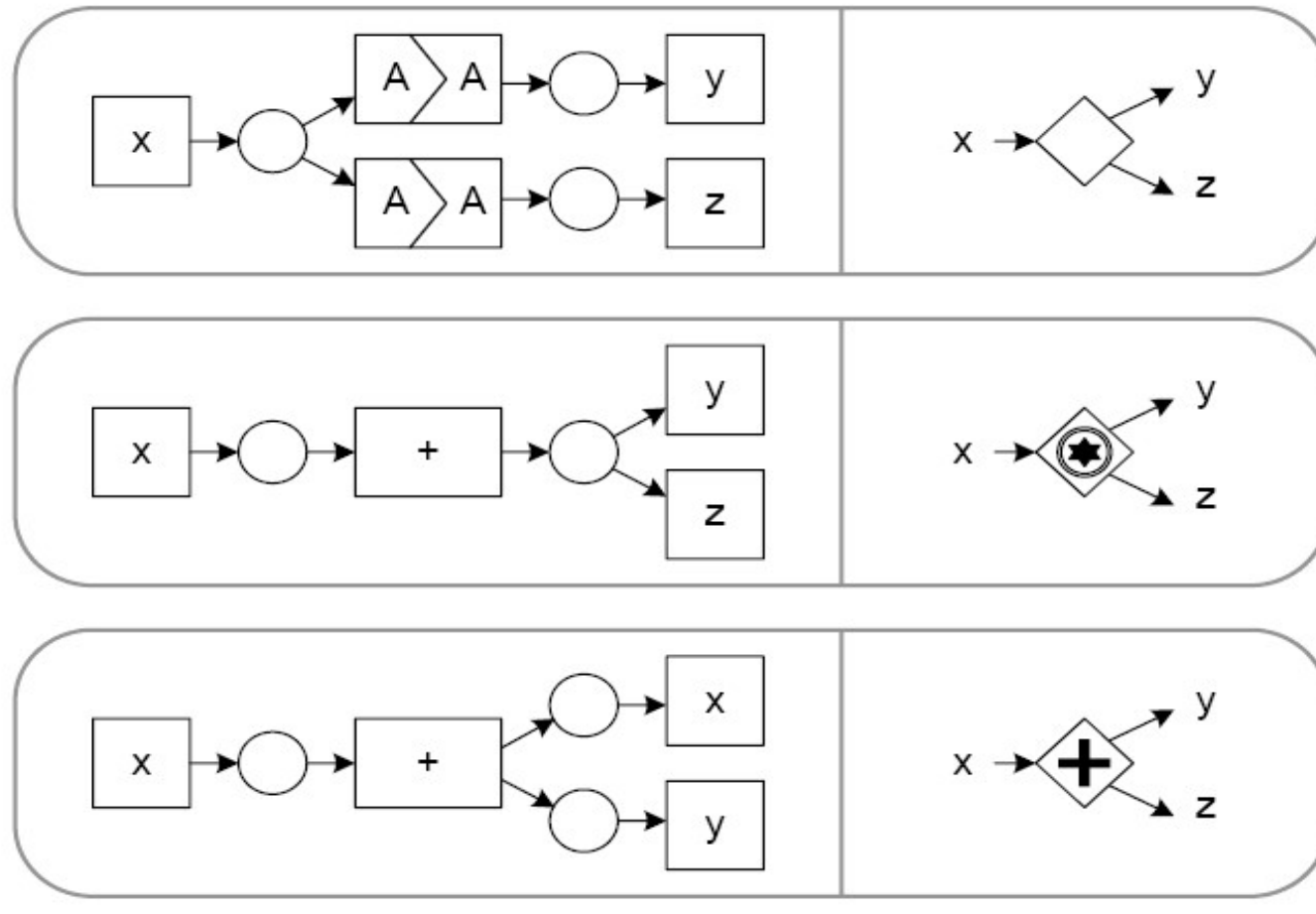


with **Context Diagram** included



About BPMN – What is BPMN?

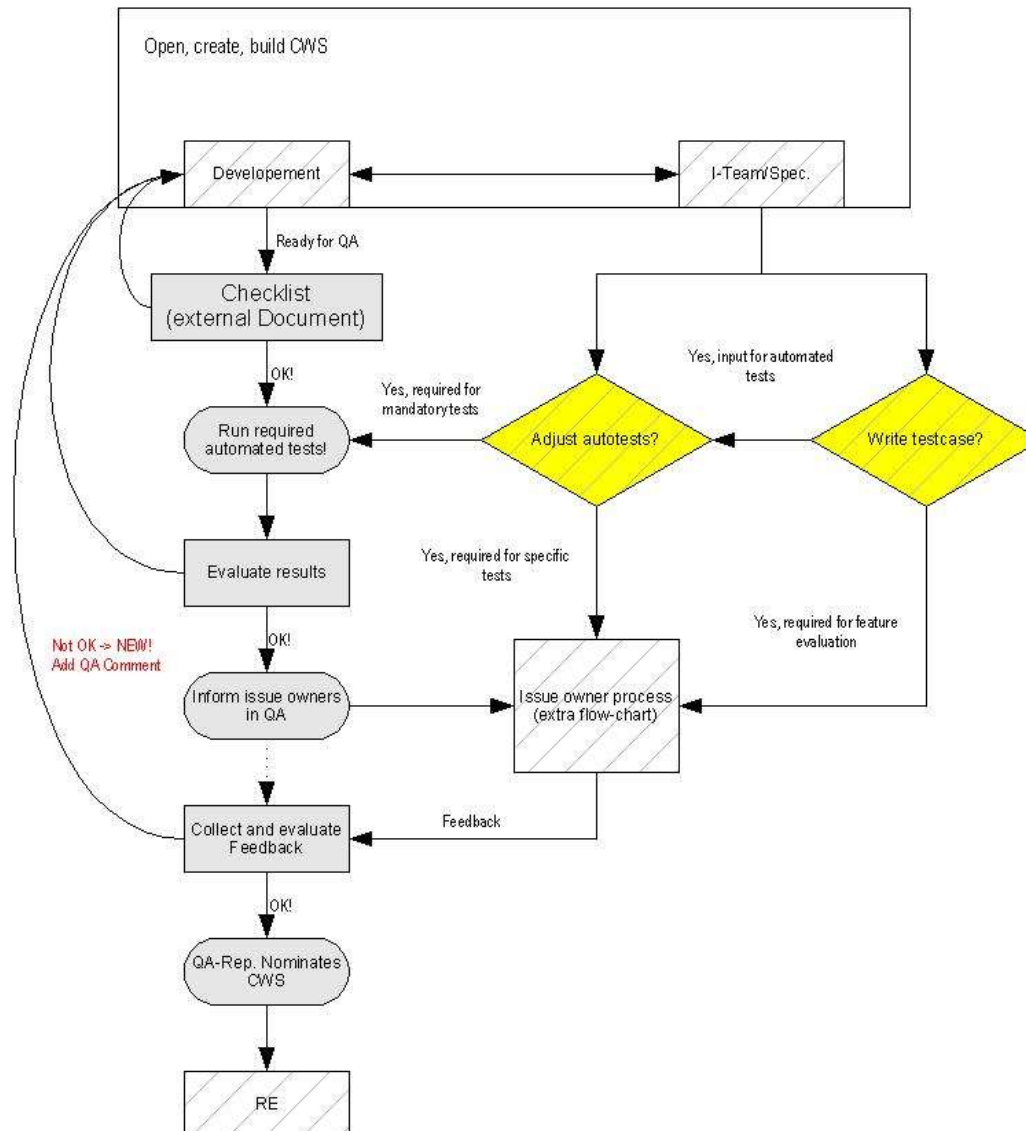
Business processes are being / have been modeled by **Petri Nets**.



Interaction Petri net patterns translated to BPMN

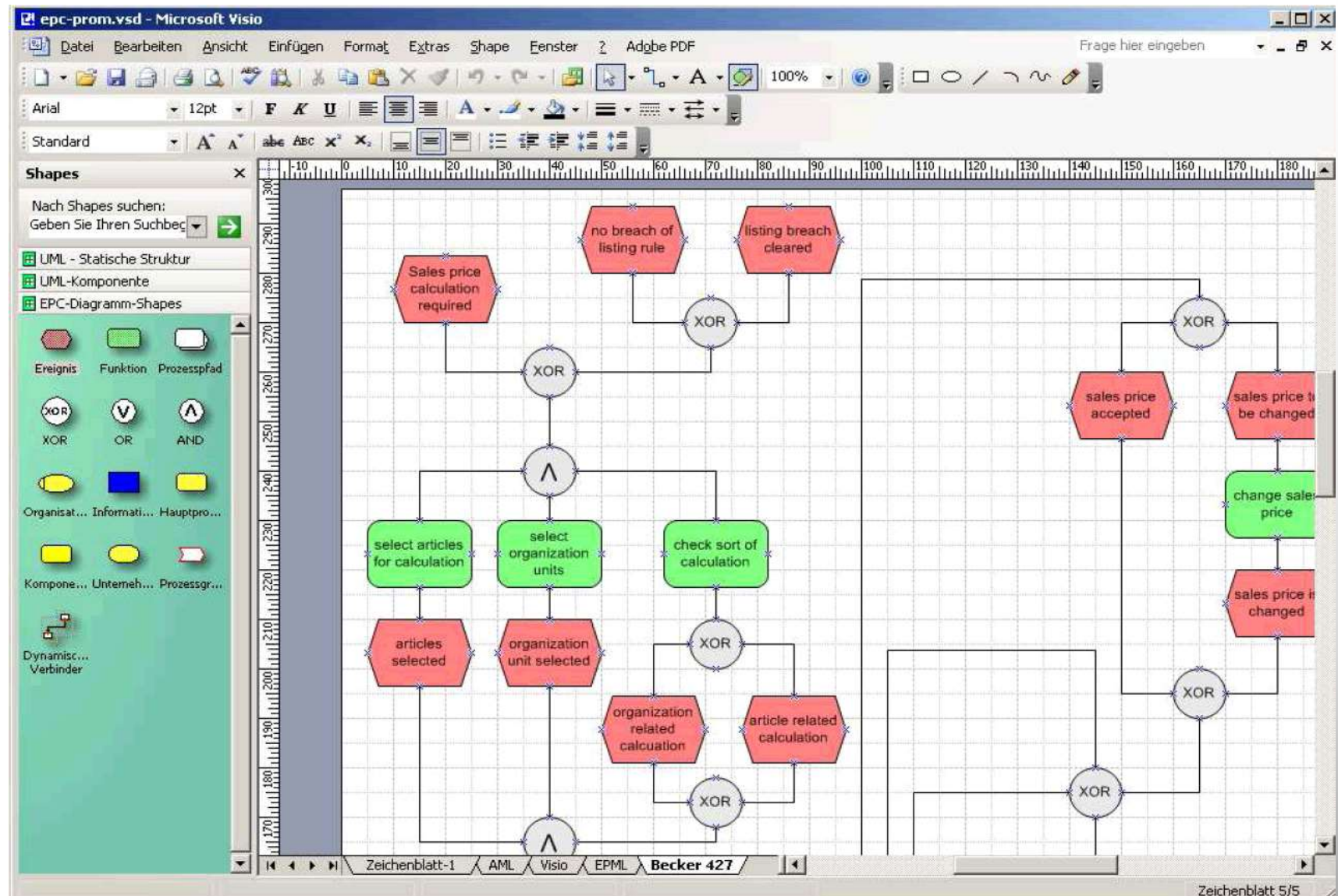
About BPMN – What is BPMN?

Business processes are being / have been modeled by **Flowcharts**.



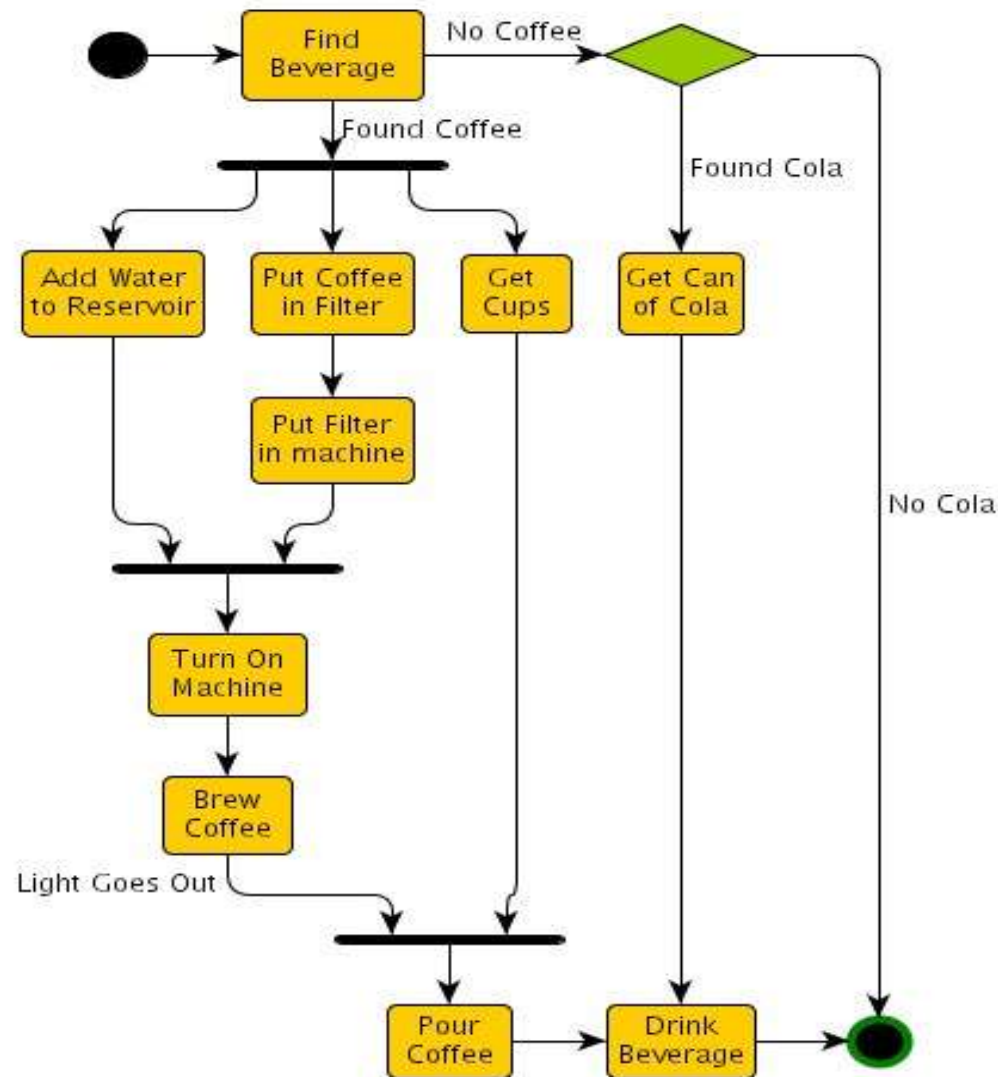
About BPMN – What is BPMN?

Business processes are being / have been modeled by **EPC (Event-driven Process Chains)**.



About BPMN – What is BPMN?

Business processes are being / have been modeled by **UML diagrams**.

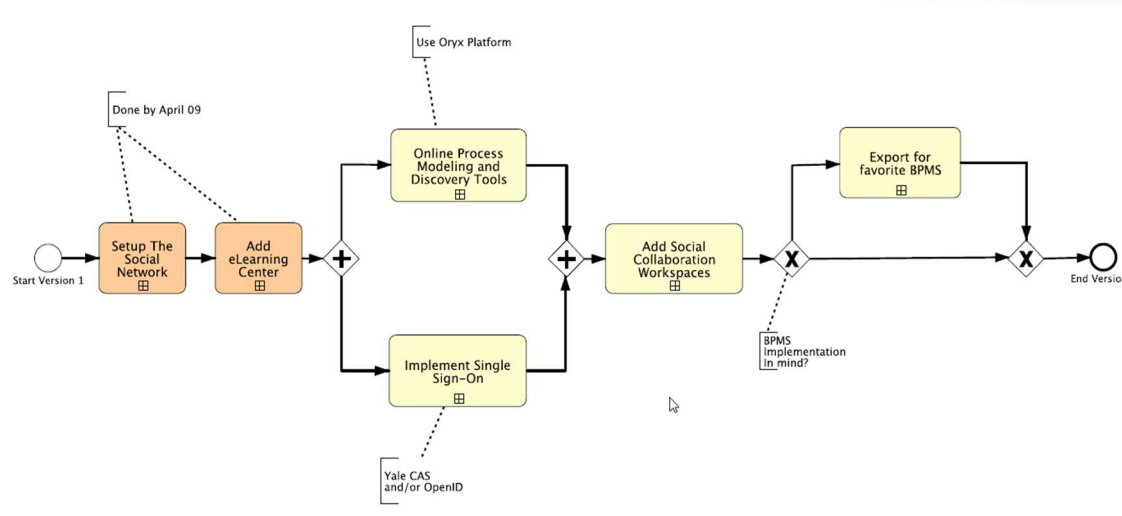
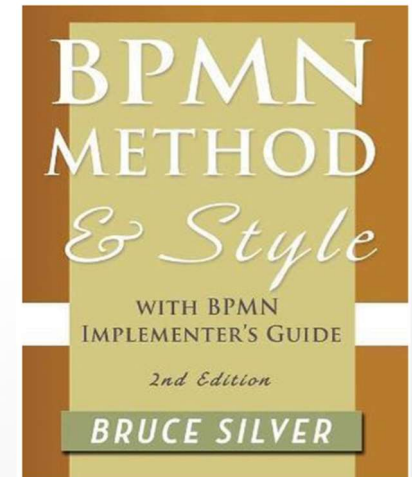


About BPMN – Modeling at 3 distinct levels

Level 1: Descriptive modeling

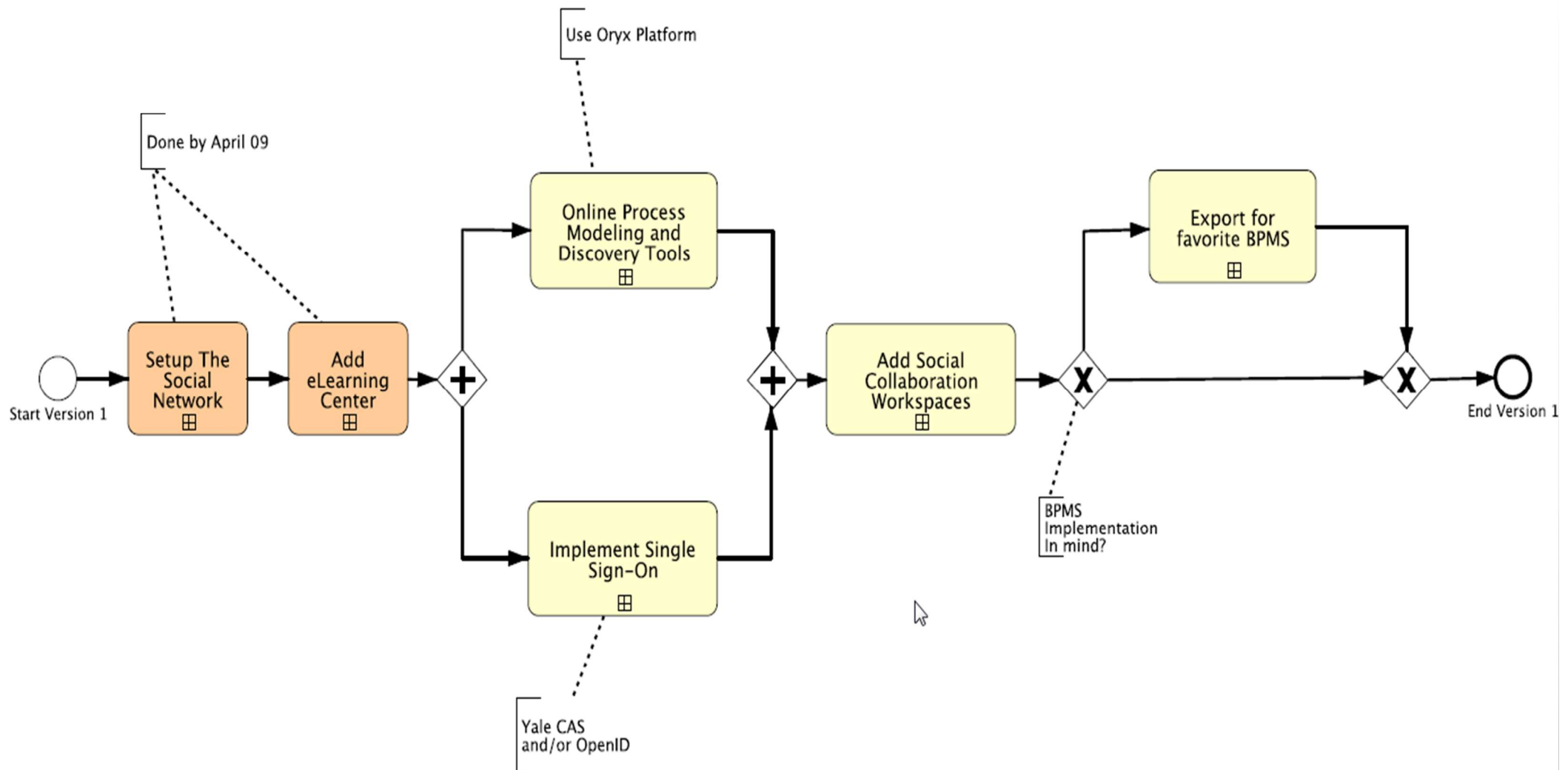
The kind most BPM consultants typically talk about — high-level, occasionally ignoring BPMN's diagram validation rules (only happy path), but **easy to communicate** across the organization, linked with a methodology for how to do it.

Level 1 modeling requires understanding of fundamental concepts such as pools and lanes, tasks and sub-processes, and sequence flow, but **not the complexities of BPMN's various flow control and event patterns**.



About BPMN – Modeling at 3 distinct levels

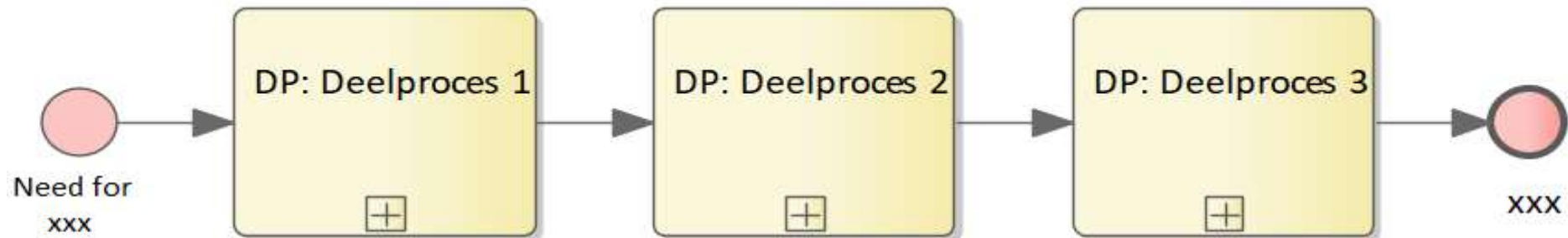
Level 1: Descriptive modeling



About BPMN – Modeling at 3 distinct levels

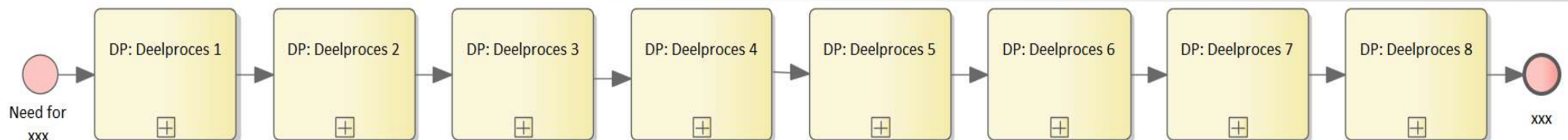
Level 1: Descriptive modeling:

Example with 3 Sub-Processes



Level 1: Descriptive modeling:

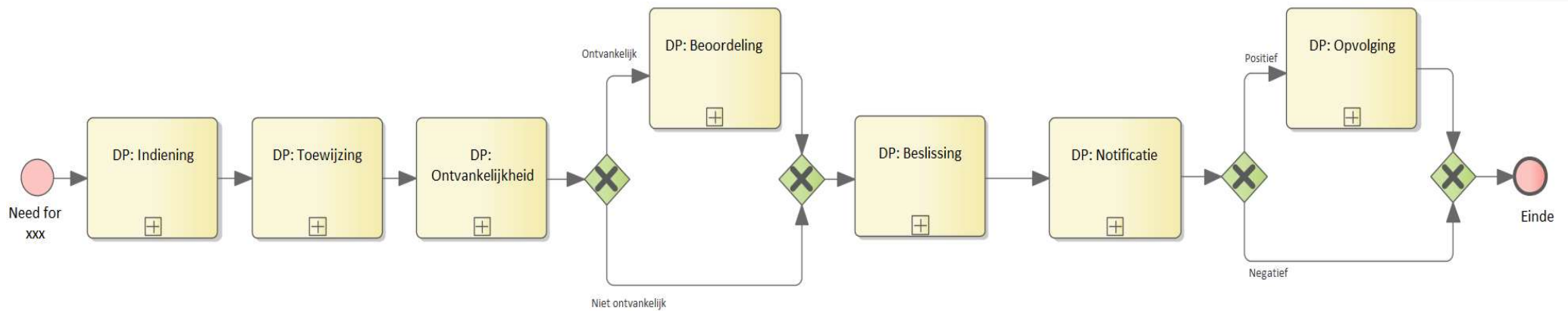
Example with 8 Sub-Processes



About BPMN – Modeling at 3 distinct levels

Level 1: Descriptive modeling:

Example with 7 Sub-Processes



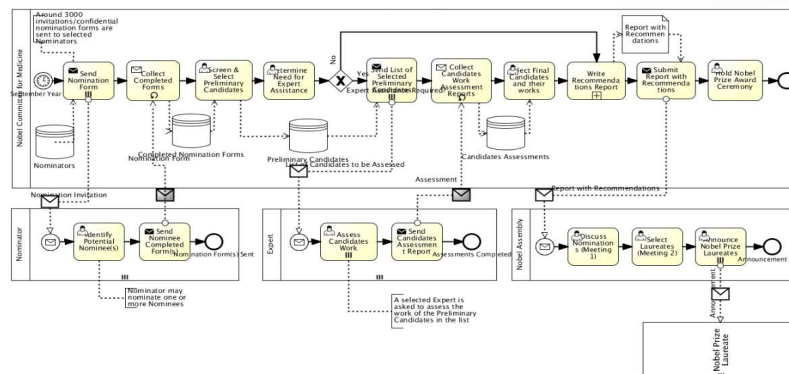
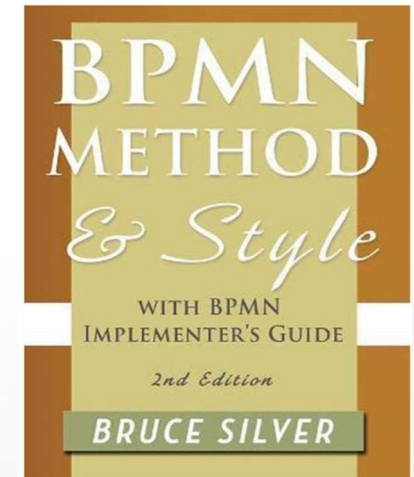
About BPMN – Modeling at 3 distinct levels

Level 2: Analytical modeling

More detailed, showing all the steps, **including the exception paths**, required either to analyze process performance using simulation or to create detailed requirements for an IT implementation.

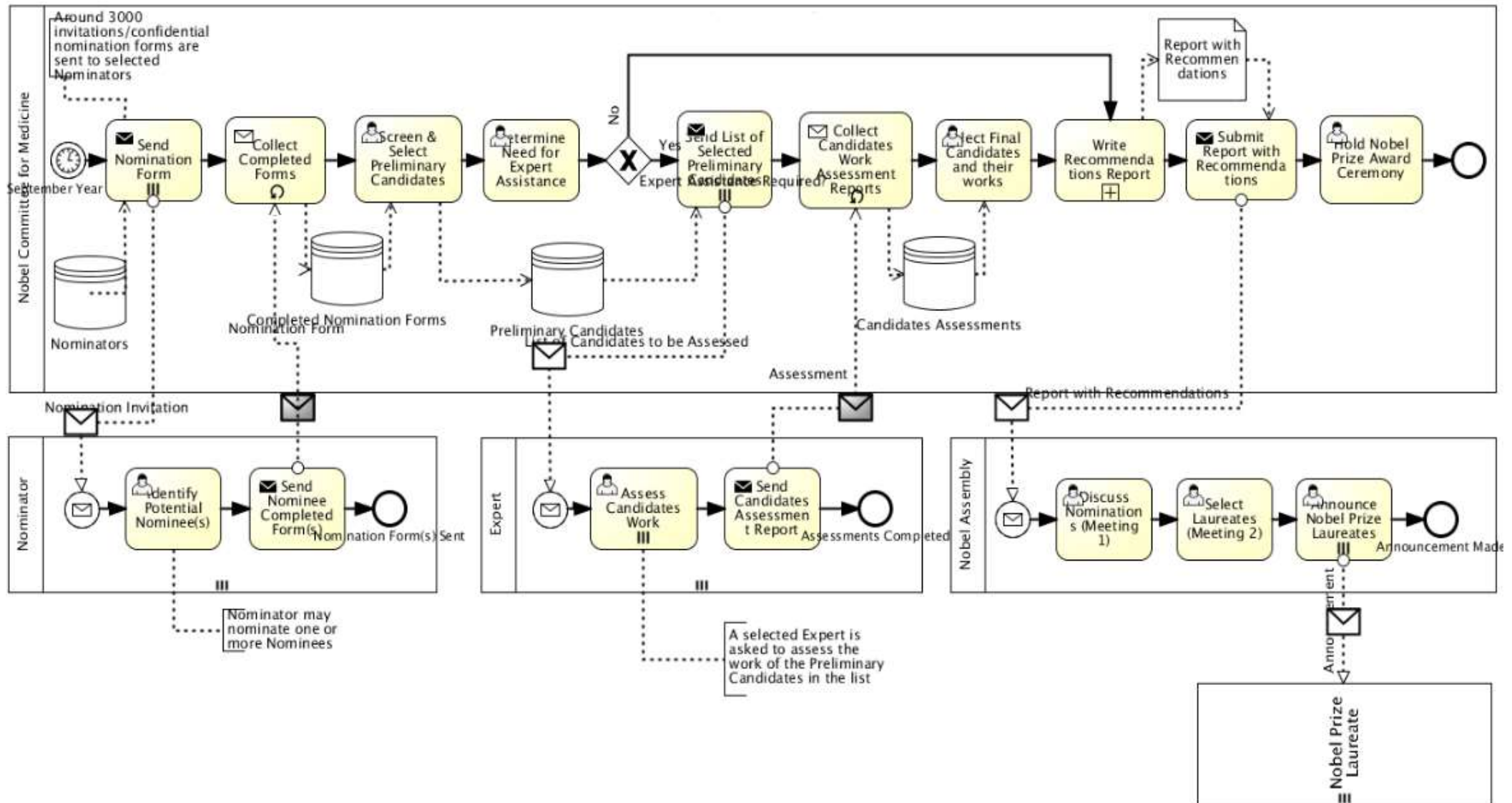
Level 2 modeling requires understanding of BPMN's various decision and merge patterns, events, and exception handling patterns.

Level 2 diagrams must be both valid according to the rules in the BPMN spec, and organized effectively as hierarchical representations of the end to end business process.



About BPMN – Modeling at 3 distinct levels

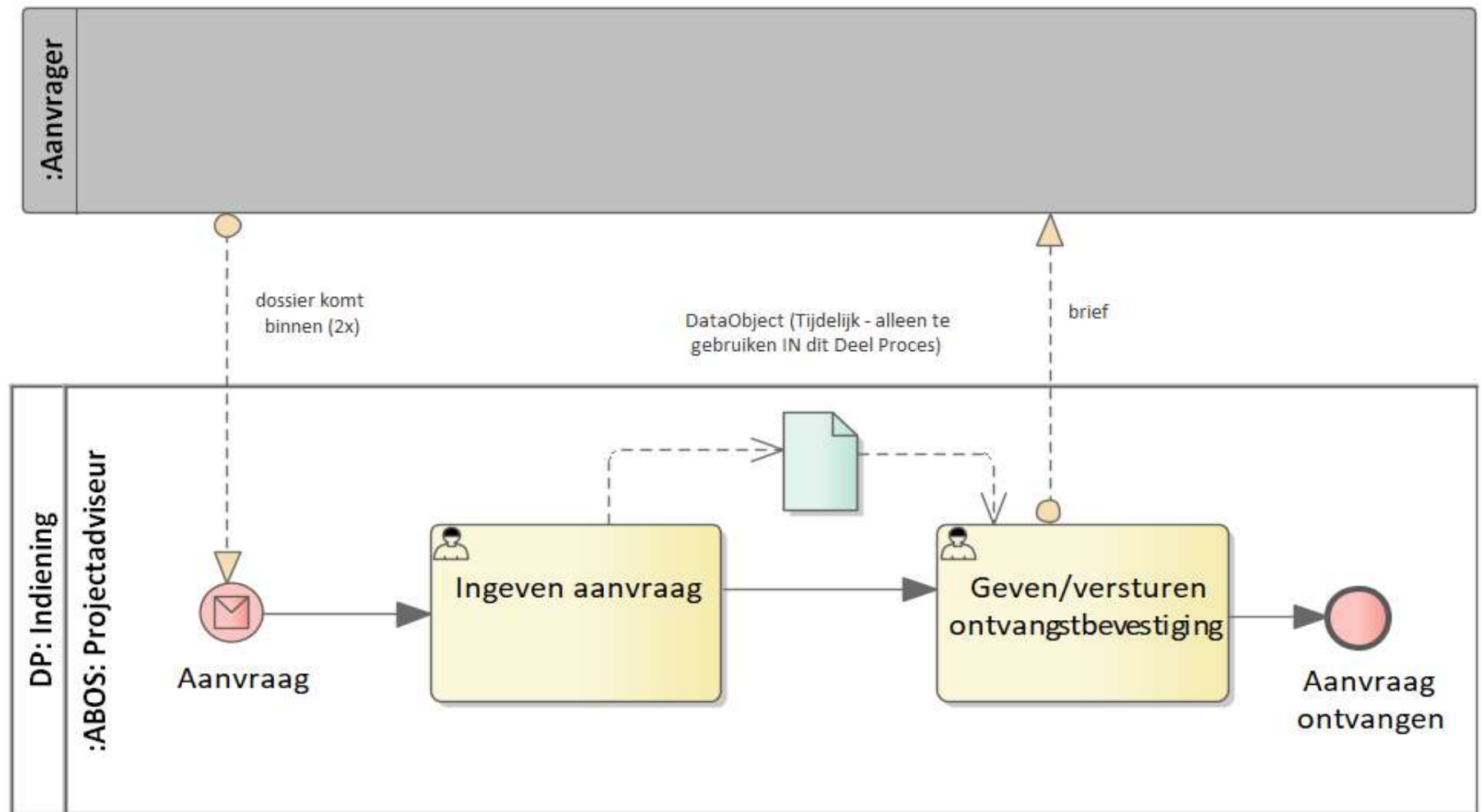
Level 2: Analytical modeling



About BPMN – Modeling at 3 distinct levels

Level 2: Analytical modeling:

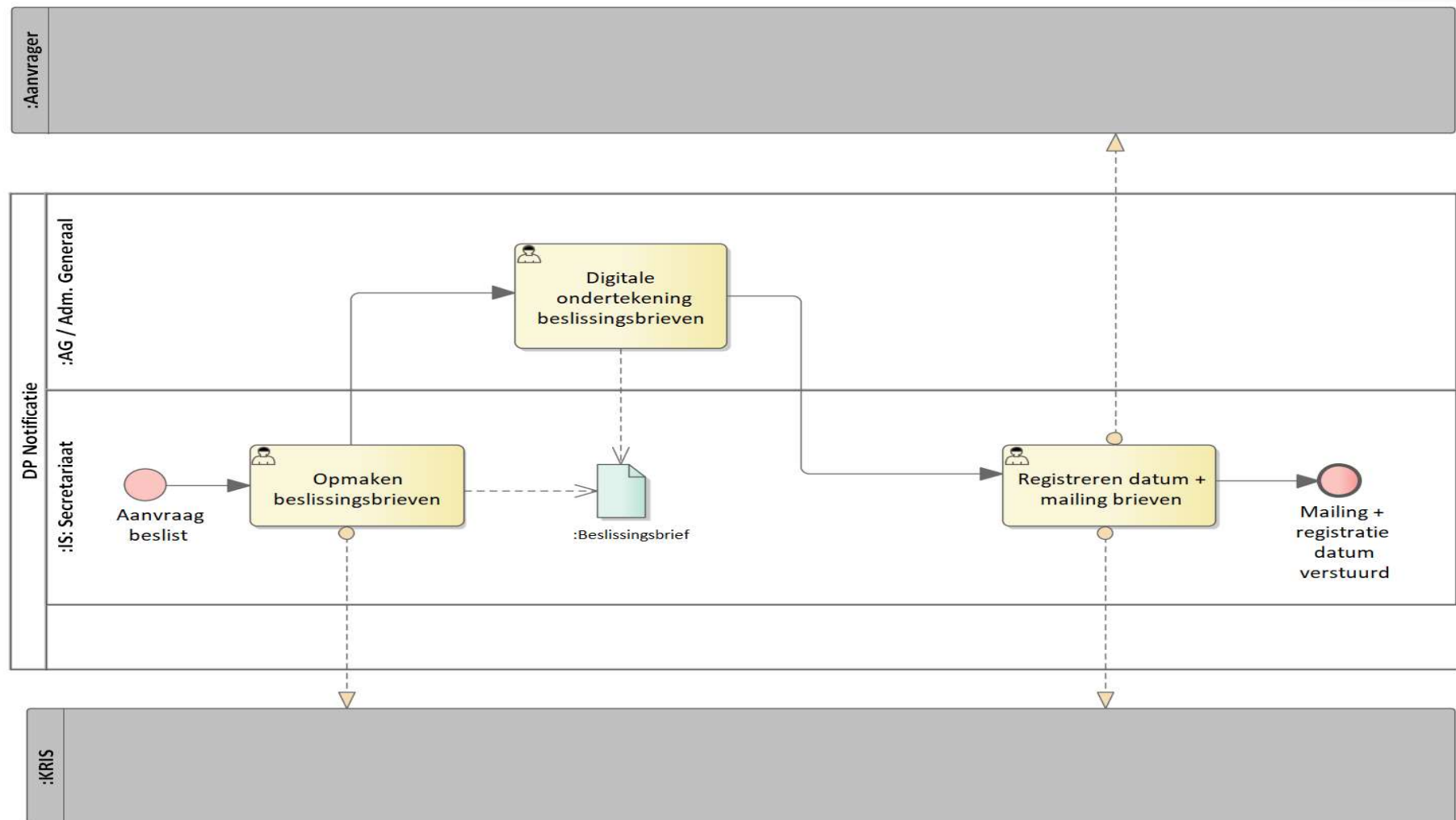
Example with 1 role and 1 application



About BPMN – Modeling at 3 distinct levels

Level 2: Analytical modeling:

Example with 2 roles and 2 applications



About BPMN – Modeling at 3 distinct levels

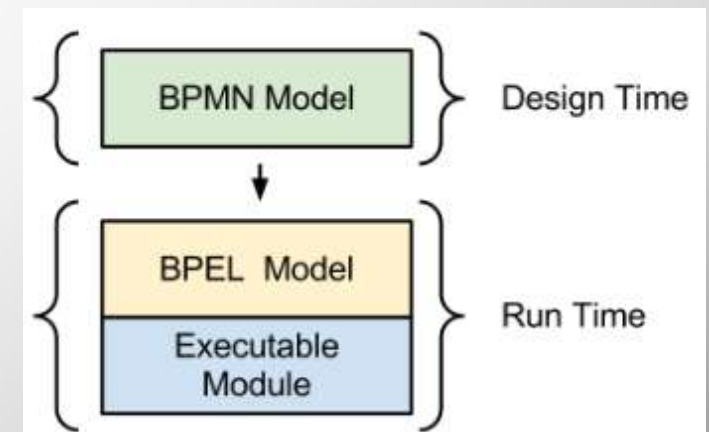
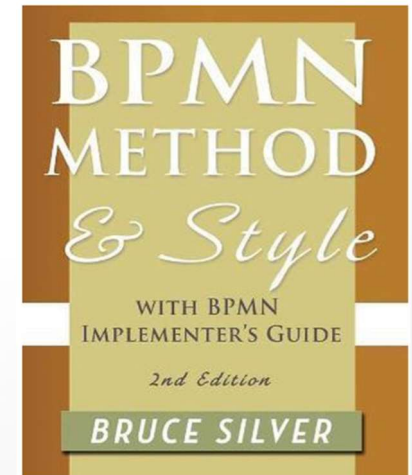
Level 3: Executable modeling

Where BPMN is part of the executable process implementation.

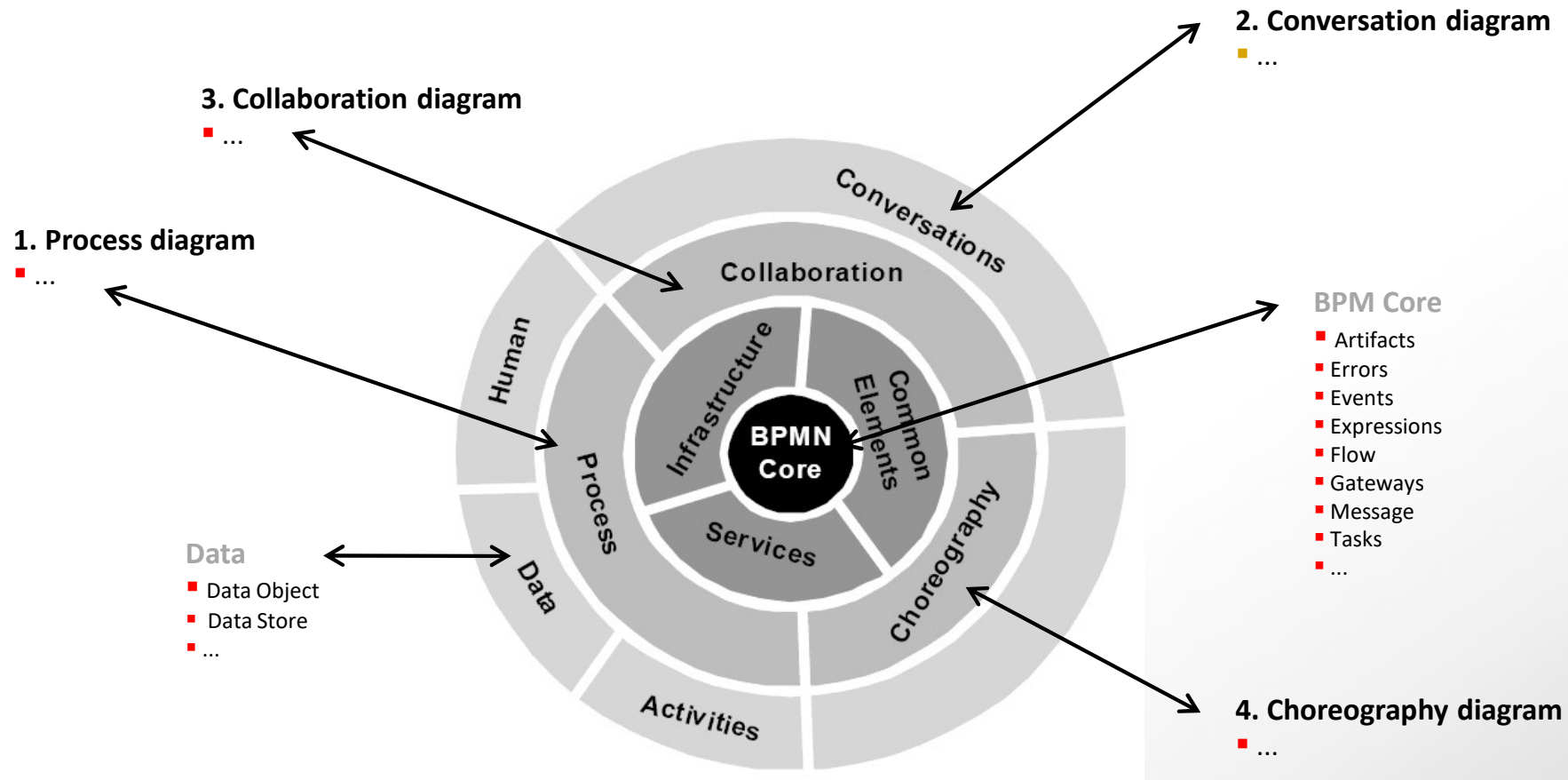
While this capability of BPMN is a major reason for its widespread adoption, modeling at this level is **somewhat vendor tool-dependent**, as most BPM Suites do not support all of the gateway and event types defined in the BPMN spec, and may offer their own proprietary extensions as well.

Moreover, most tools ignore the BPMN spec's implementation attributes, and instead provide equivalent implementation detail in tool-specific attributes of the model's activities, gateways, and events.

Level 3 diagrams thus typically impose additional validation constraints beyond those of the BPMN spec.



The structuring of BPMN



The structuring of BPMN is based on the concept of extensibility layers on top of a basic series of simple elements identified as Core Elements of the specification.

The syntax of BPMN

The BPD Core Element Set:

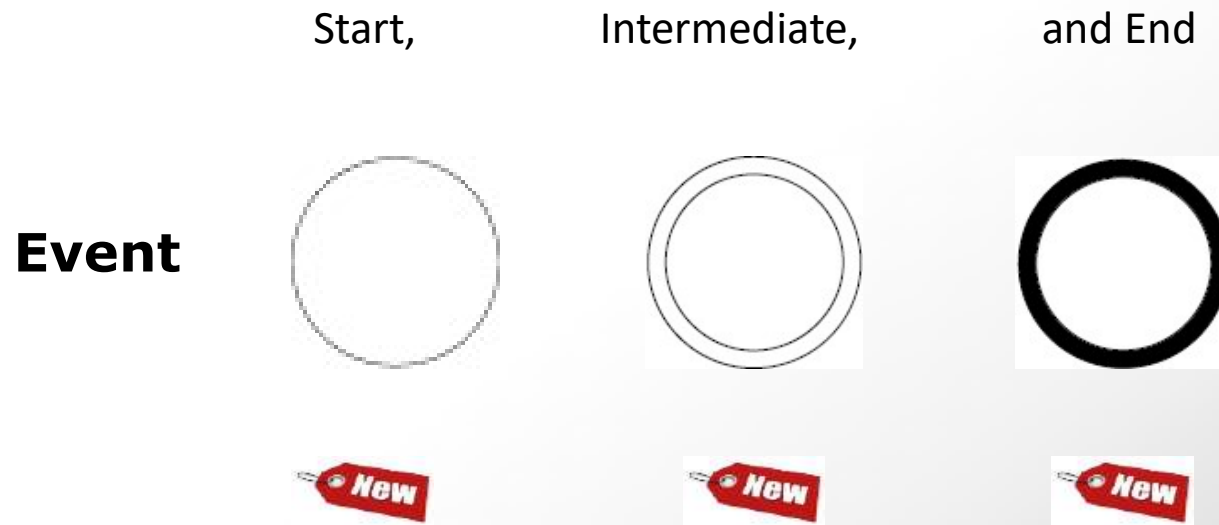
1. Flow Objects
2. Connecting Objects / Connectors
3. Swim lanes
4. Artifacts

The syntax of BPMN – 1.1 Flow Objects

A BPD has a small set of (three) core elements, which are the Flow Objects, so that modelers do not have to learn and recognize a large number of different shapes.

The first Flow Object is:

An **Event** is represented by a circle and is something that “happens” during the course of a business process. These Events affect the flow of the process and usually have a cause (trigger) or an impact (result). Events are circles with open centers to allow internal markers to differentiate different triggers or results. There are three types of Events, based on when they affect the flow:



The syntax of BPMN – 1.2 Flow Objects

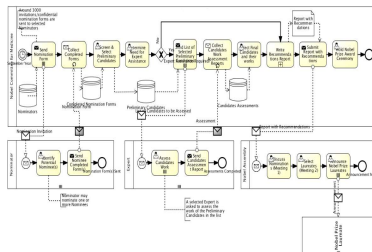
A BPD has a small set of (three) core elements, which are the Flow Objects, so that modelers do not have to learn and recognize a large number of different shapes.

The second Flow Object is:

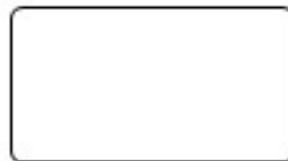
An **Activity** is represented by a rounded-corner rectangle (see the figure to the right) and is a generic term for work that company performs.

An Activity can be atomic or non atomic (compound). The types of Activities are: **Task** and **Sub-Process**. The Sub-Process is distinguished by a small plus sign in the bottom center of the shape.

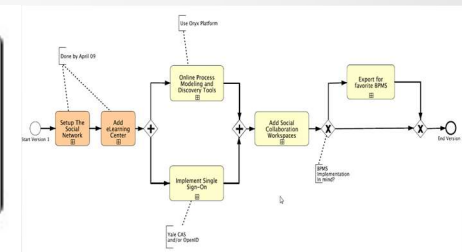
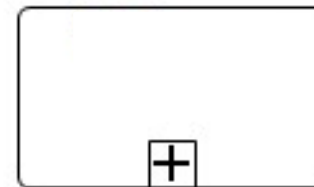
Activity



Task



Sub-Process



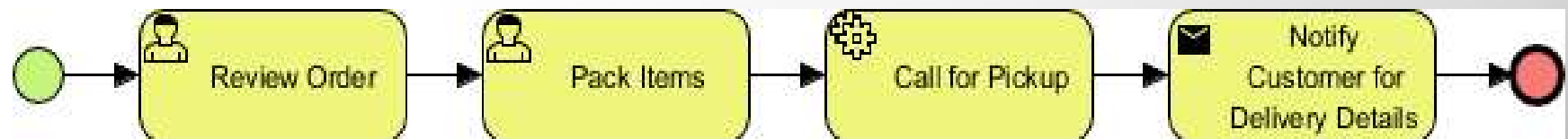
BPMN - Examples

Example: Activity (Tasks)

Read from left to right



Example will be expanded in the next slides



The syntax of BPMN – 1.3 Flow Objects

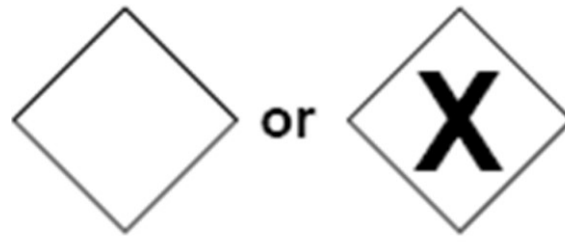
A BPD has a small set of (three) core elements, which are the Flow Objects, so that modelers do not have to learn and recognize a large number of different shapes.

The third Flow Objects is:

A **Gateway** is represented by the familiar diamond shape and is used to control the divergence and convergence of Sequence Flow. Thus, it will determine traditional decisions, as well as the forking, merging, and joining of paths. Internal Markers will indicate the type of behavior control.

Exclusive (XOR) Data-Based

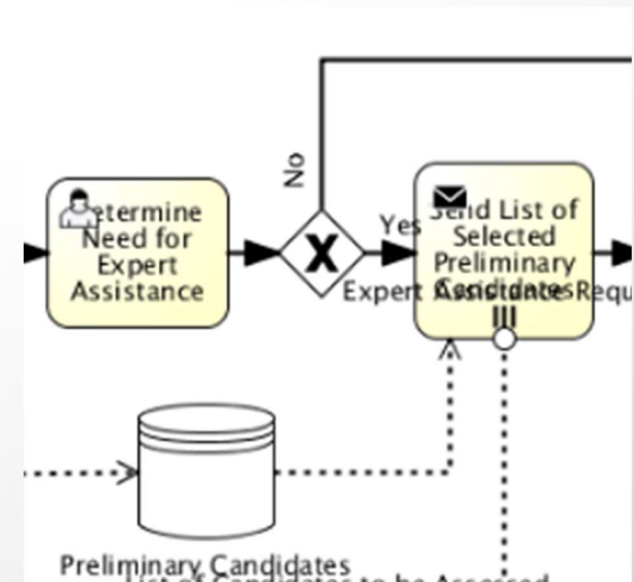
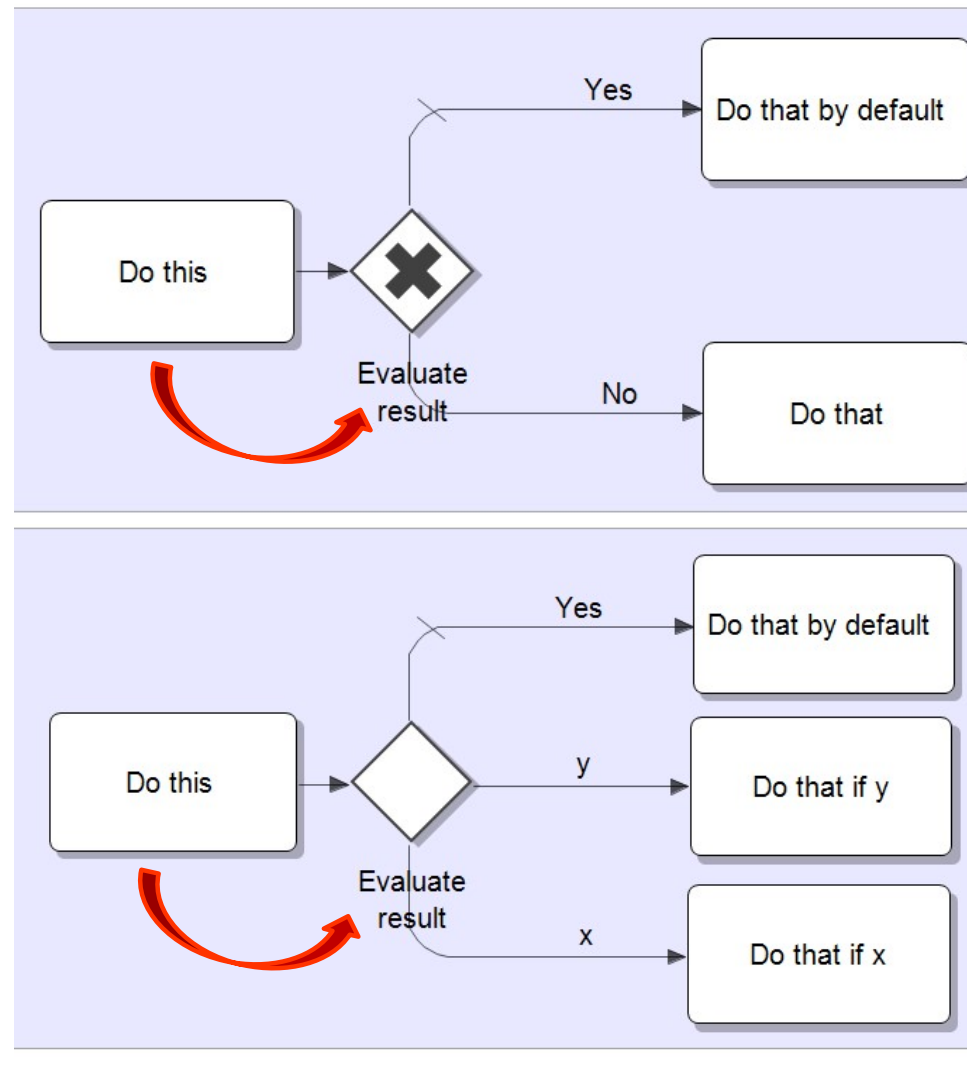
Gateway



BPMN - Examples

Example: Exclusive XOR gateway

Gateways can be shown with or without an internal 'X' marker.



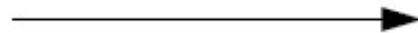
The syntax of BPMN – 2.1 Connecting Objects

The Flow Objects are connected together in a diagram to create the basic skeletal structure of a business process. There are three Connecting Objects that provide this function.

The first connector is:

A Sequence Flow is represented by a solid line with a solid arrowhead (see the figure to the right) and is used to show the order (the sequence) that activities will be performed in a Process. Note that the term “control flow” is generally not used in BPMN.

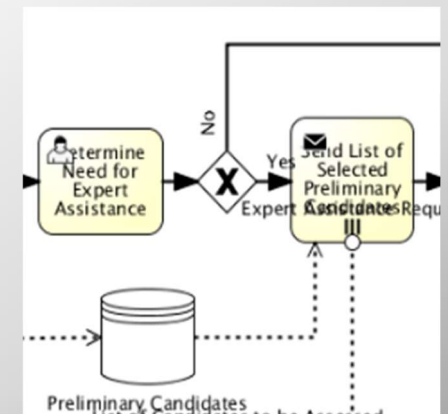
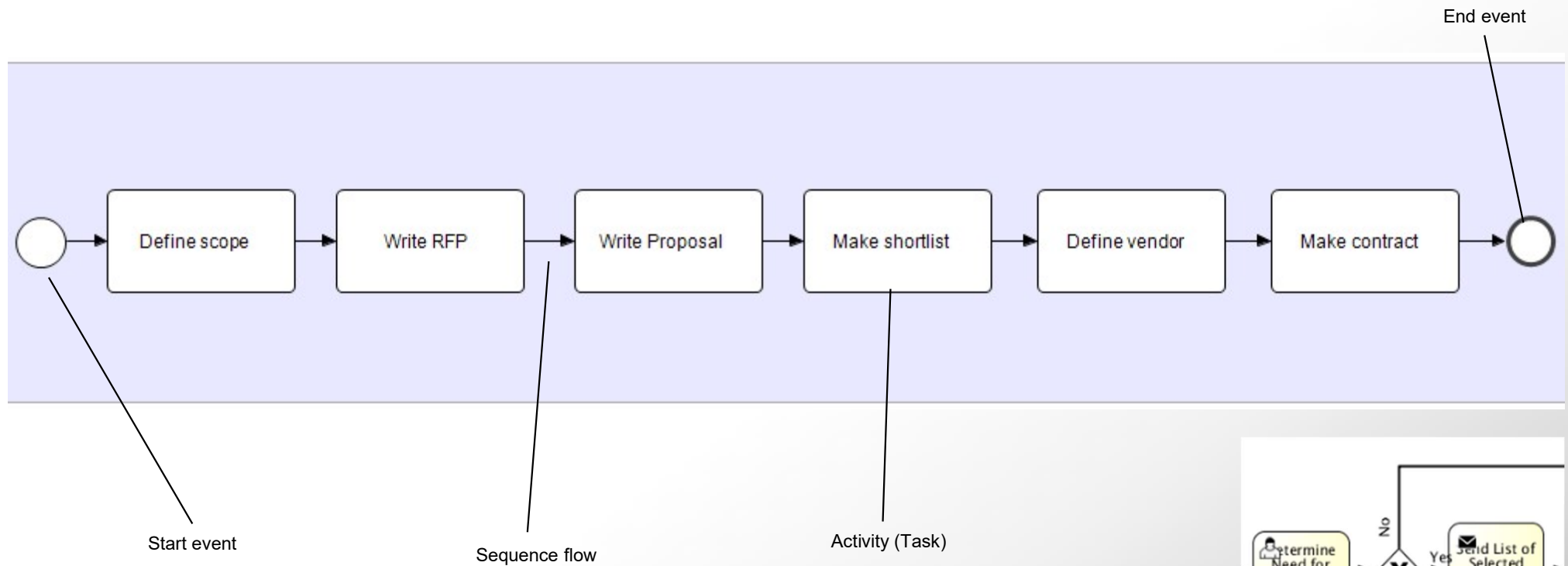
Sequence Flow



BPMN - Examples

Example: Private (Internal) Business Process

Private business processes are those internal to a specific organization and are the types of processes that have been generally called **workflow** or BPM processes.



The syntax of BPMN – 2.2 Connecting Objects

The Flow Objects are connected together in a diagram to create the basic skeletal structure of a business process. There are three Connecting Objects that provide this function.

The second connector is:

A **Message Flow** is represented by a dashed line with an open arrowhead and is used to show the flow of messages between two separate Process Participants (business entities or business roles) that send and receive them. In BPMN, two separate Pools in the Diagram will represent the two Participants.

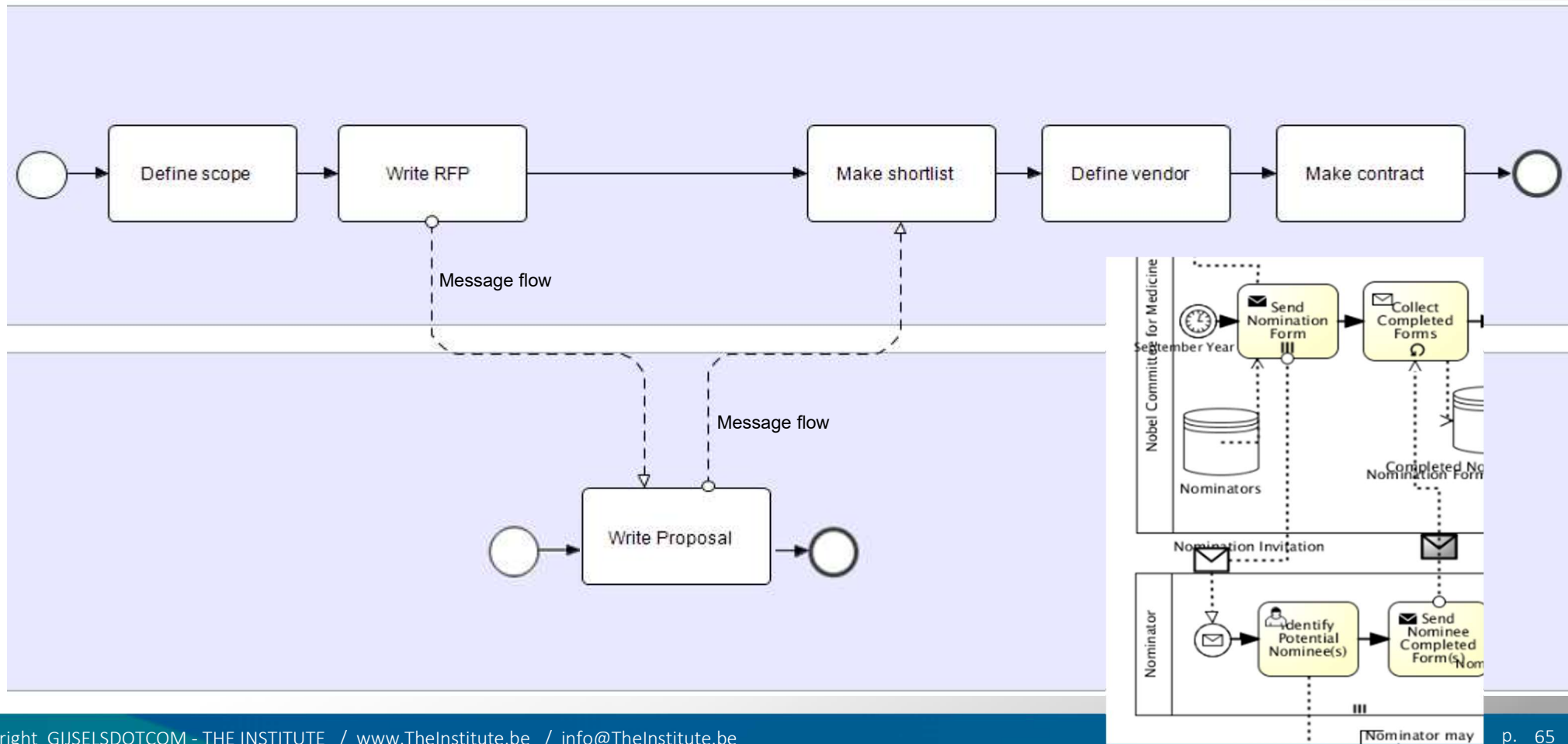
Message Flow



BPMN - Examples

Example: Message between people/machine and machine/machine

The BPMN business process diagram augments the Sequence Flow line with a **B2B** Message Flow line, so that you can model people or machines sending messages to one another – an important part of depicting and understanding business-to-business and business-to-consumer processes.



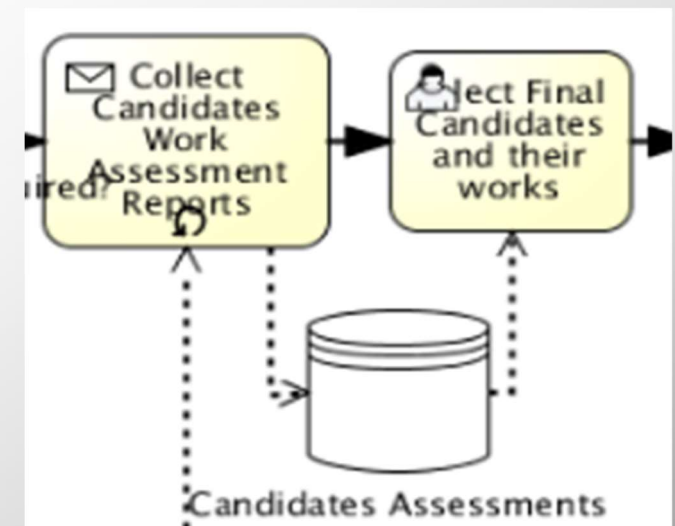
The syntax of BPMN – 2.3 Connecting Objects

The Flow Objects are connected together in a diagram to create the basic skeletal structure of a business process. There are three Connecting Objects that provide this function.

The third connector is:

An **Association** is represented by a dotted line with a line arrowhead and is used to associate data, text, and other Artifacts with flow objects. Associations are used to show the inputs and outputs of activities.

Association



The syntax of BPMN – 3.1 Swim lanes

Many process modeling methodologies utilizes the concept of swim lanes as a mechanism to organize activities into separate visual categories in order to illustrate different functional capabilities or responsibilities. BPMN supports swim lanes with two main constructs.

The first type of BPD swimlane object is:

A **Pool** represents **a process / an organization** dependent on the style of modeling. It also acts as a graphical container for partitioning a set of activities from other Pools, usually in the context of B2B situations.

Pool



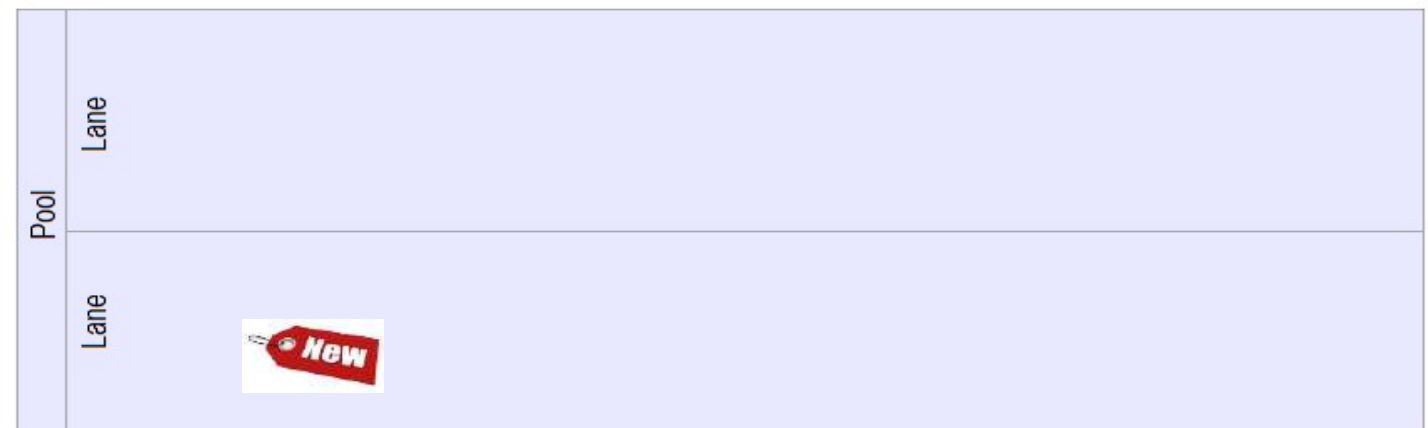
The syntax of BPMN – 3.2 Swim lanes

Many process modeling methodologies utilizes the concept of swim lanes as a mechanism to organize activities into separate visual categories in order to illustrate different functional capabilities or responsibilities. BPMN supports swim lanes with two main constructs.

The second type of BPD swimlane object is:

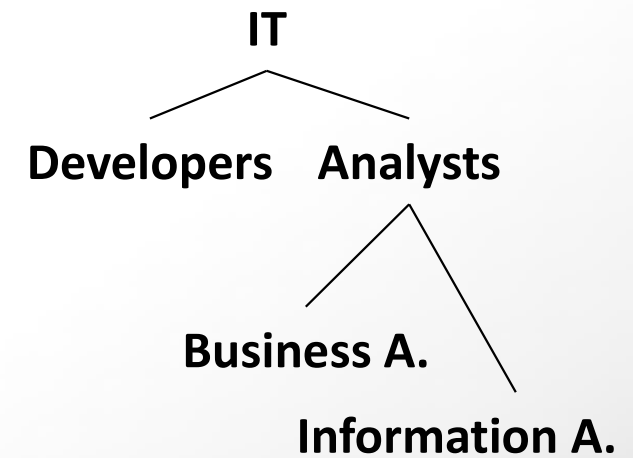
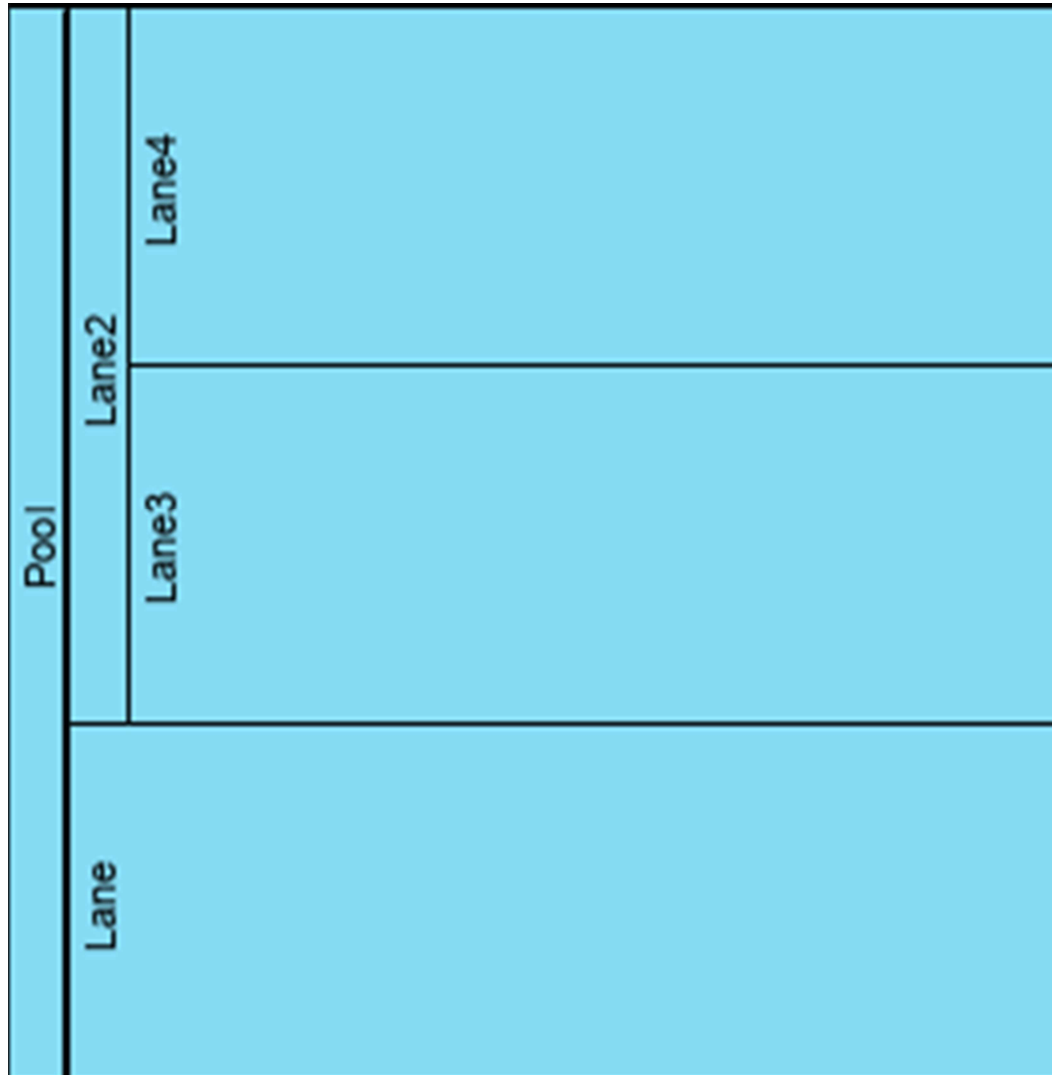
A **Lane** represents a **department** within that process / organization (Pool) or a sub-partition within a Pool and will extend the entire length of the Pool, either vertically or horizontally. Lanes are used to organize and categorize activities. By taking processes and placing them in pools or lanes, you are specifying who does what; for events, you specify where they occur; and, for gateways, you specify where decisions are made, or who makes them.

(Swim) lanes



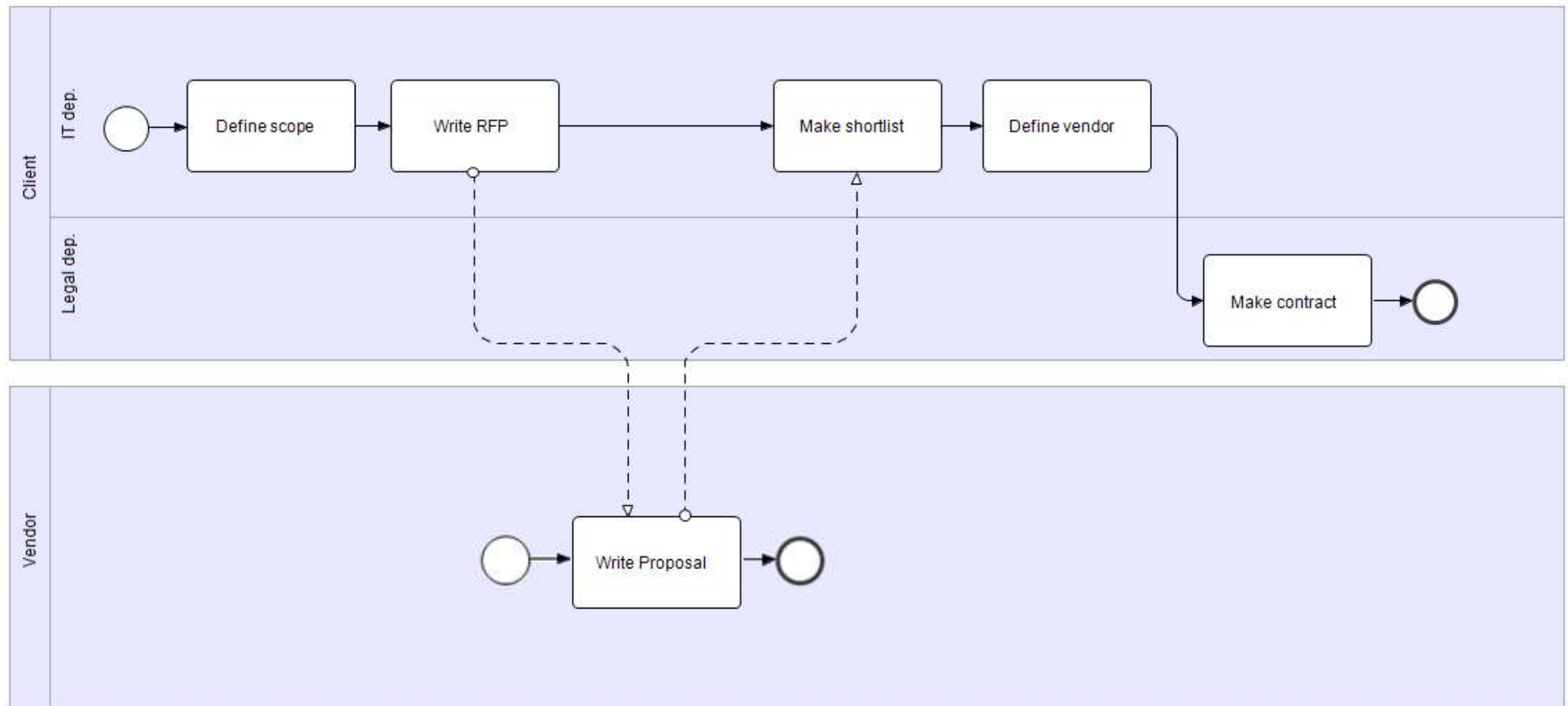
BPMN - Examples

Example: Pools and Lanes, and Lanes in Lanes



BPMN - Examples

Example: Pools and Lanes



The syntax of BPMN – 4.1 Artifacts

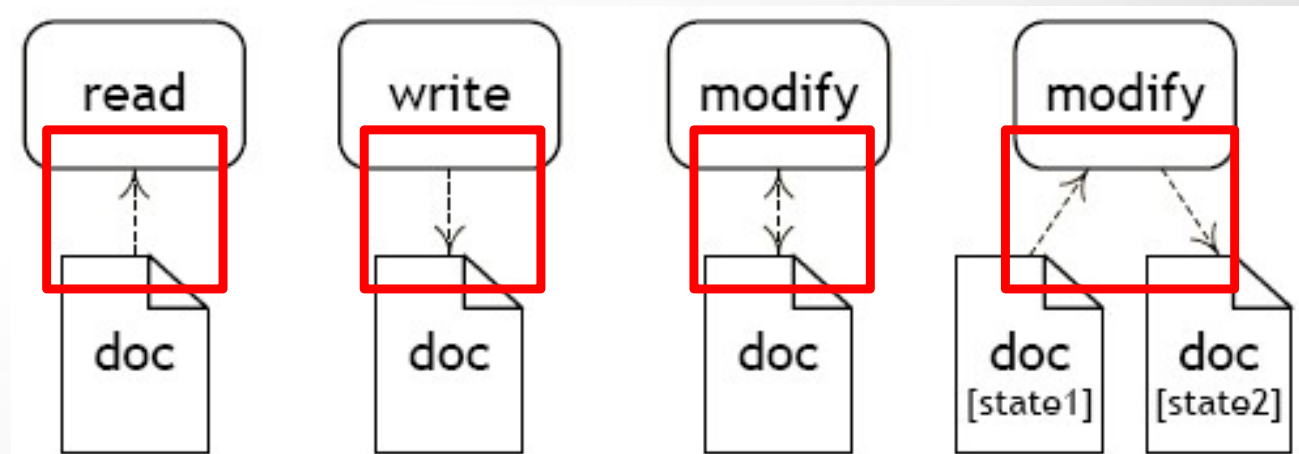
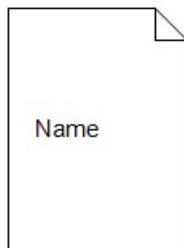
BPMN was designed to allow modelers and modeling tools some flexibility in extending the basic notation and in providing the ability to additional context appropriate to a specific modeling situation, such as for a vertical market (e.g., insurance or banking). Any number of Artifacts can be added to a diagram as appropriate for the context of the business processes being modeled.

The BPMN specification pre-defines only three types of BPD Artifacts, the first is:

Data Objects are a mechanism to show how data is required or produced by activities. They are connected to activities through **Associations**.

Data Objects can only be used inside of a process and is therefor written 'in-the' pool.

Data Objects



The syntax of BPMN – 4.1 Stores

BPMN was designed to allow modelers and modeling tools some flexibility in extending the basic notation and in providing the ability to additional context appropriate to a specific modeling situation, such as for a vertical market (e.g., insurance or banking). Any number of Artifacts can be added to a diagram as appropriate for the context of the business processes being modeled.

The BPMN specification pre-defines only three types of BPD Artifacts, the first is:

Data Stores is external to the process but has store/retrieve access to it.

A Data Store provides a place in the Process where Activities can retrieve or update stored information that will persist beyond the scope of the Process.

The Data Store uses directional data association to show data flow to/from the process.

Data Stores can only be used outside of a process and is therefor written 'out-off-the' pool.

Data Stores

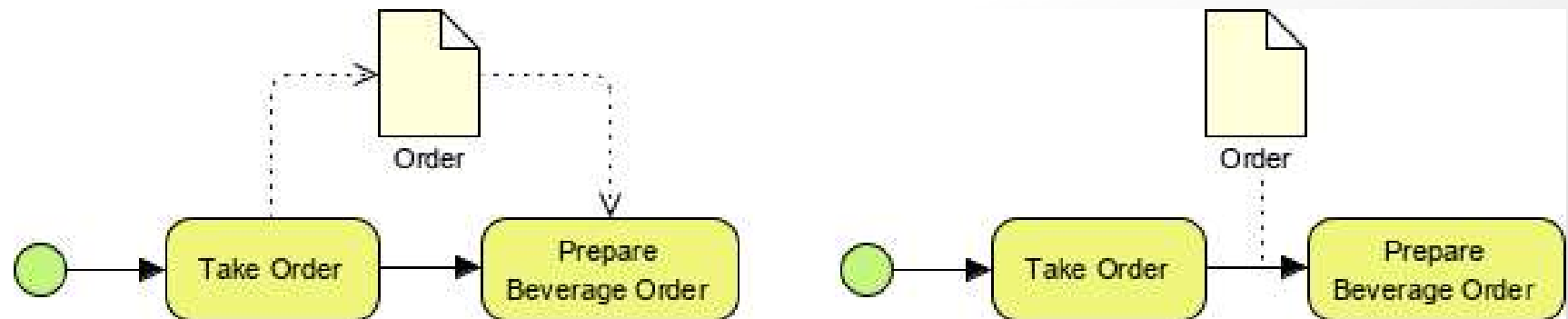


BPMN - Examples

Example: Association and Data object artifact

Data objects are artifacts that may represent many different types of electronic or physical items.

Modeling data objects is optional – they do not have any direct affect on the process flow.

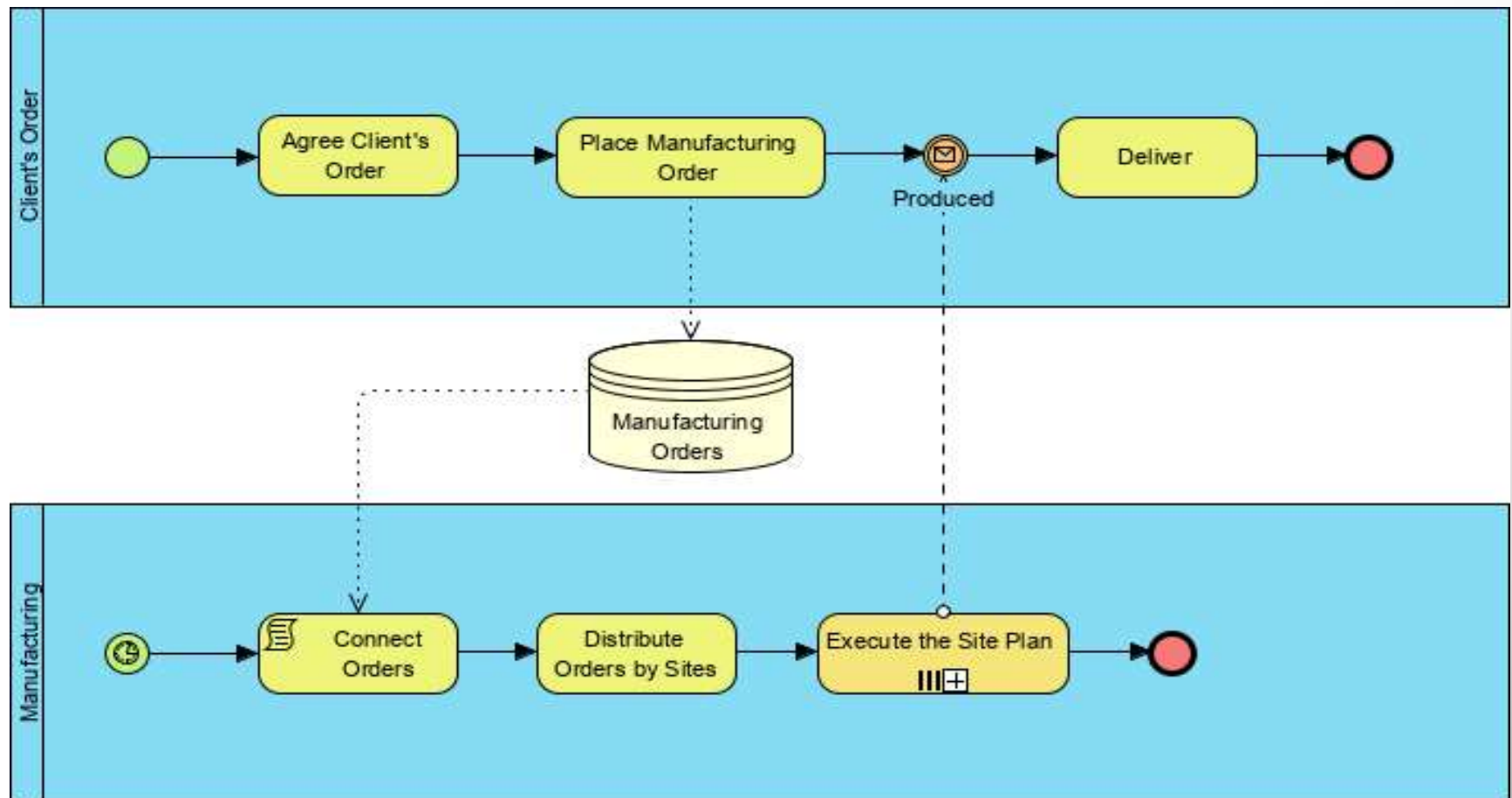


BPMN - Examples

Example: Association and Data store artifact

Data stores are artifacts that are shared between processes.

Best practice is to put them outside the process because they do not belong to the process.



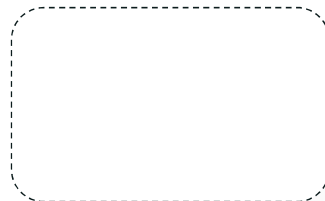
The syntax of BPMN – 4.2 Artifacts

BPMN was designed to allow modelers and modeling tools some flexibility in extending the basic notation and in providing the ability to additional context appropriate to a specific modeling situation, such as for a vertical market (e.g., insurance or banking). Any number of Artifacts can be added to a diagram as appropriate for the context of the business processes being modeled.

The current version of the BPMN specification pre-defines only three types of BPD Artifacts, the second is:

A **Group** is represented by a rounded corner rectangle drawn with a dashed line. The grouping can be used for documentation or analysis purposes, but does not affect the Sequence Flow.

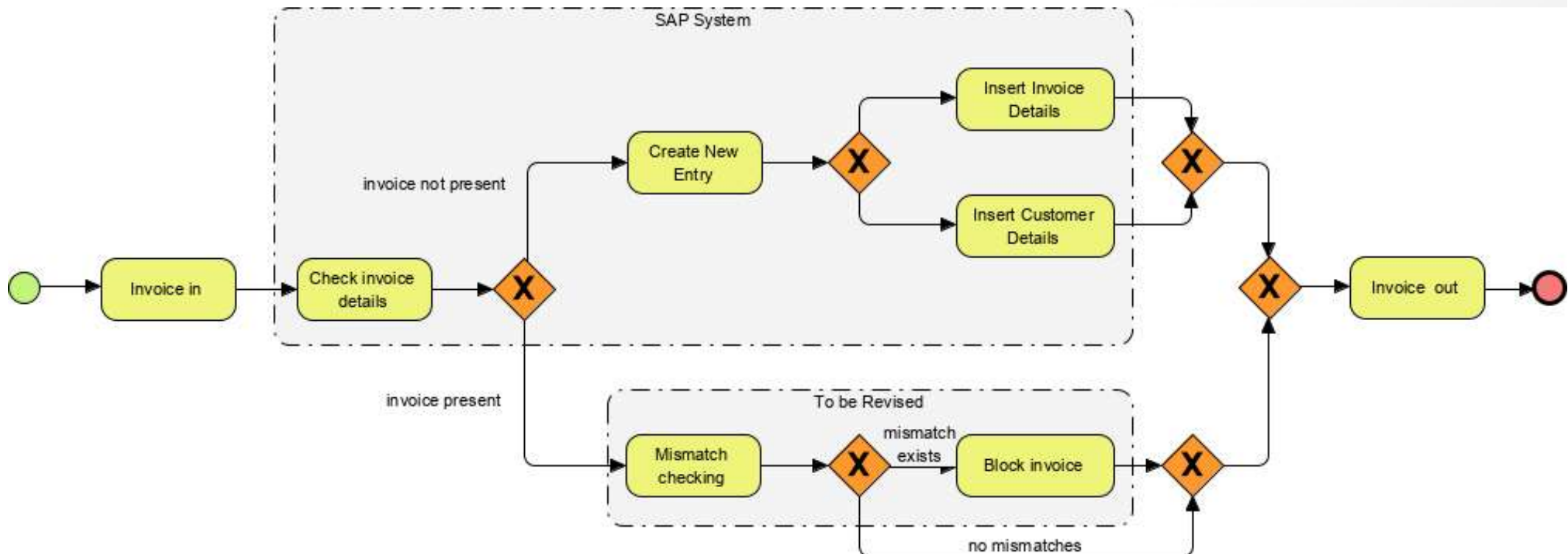
Group



BPMN - Examples

Example: Group artifact

As an Artifact, a **Group** is not an activity and therefore, cannot connect to Sequence or Message Flows. In addition, Groups are not constrained by restrictions of Pools and Lanes and can stretch across the boundaries of a Pool, often to identify activities that exist within a distributed B2B transaction.



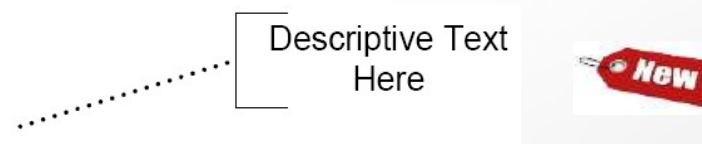
The syntax of BPMN – 4.3 Artifacts

BPMN was designed to allow modelers and modeling tools some flexibility in extending the basic notation and in providing the ability to additional context appropriate to a specific modeling situation, such as for a vertical market (e.g., insurance or banking). Any number of Artifacts can be added to a diagram as appropriate for the context of the business processes being modeled.

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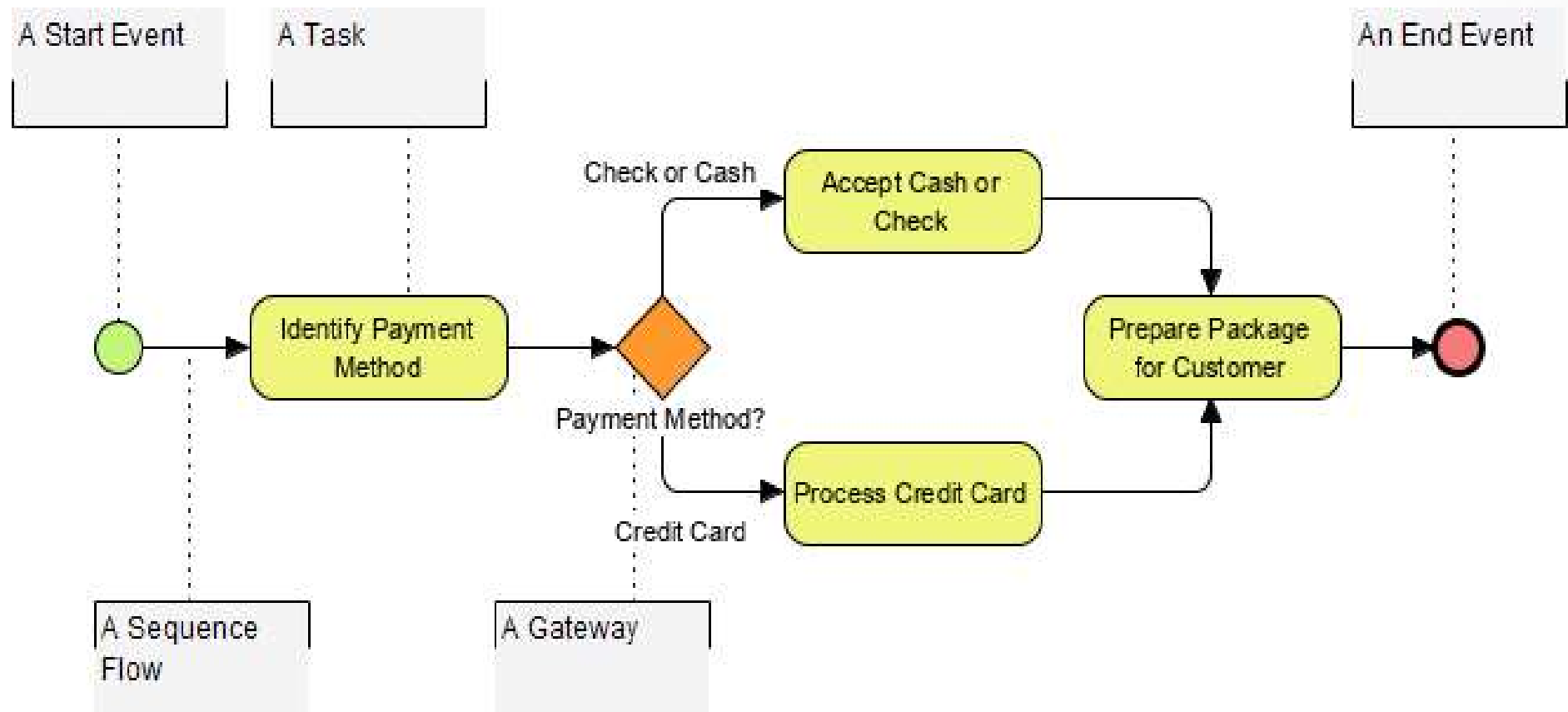
Annotations are a mechanism for a modeler to provide additional text information for the reader of a BPMN Diagram.

Annotation



BPMN - Examples

Example: Annotation artifact



BPMN - Examples

Example: Abstract (Public) Processes (also called black-box)

This represents the interactions between a private business process and another process or participant.

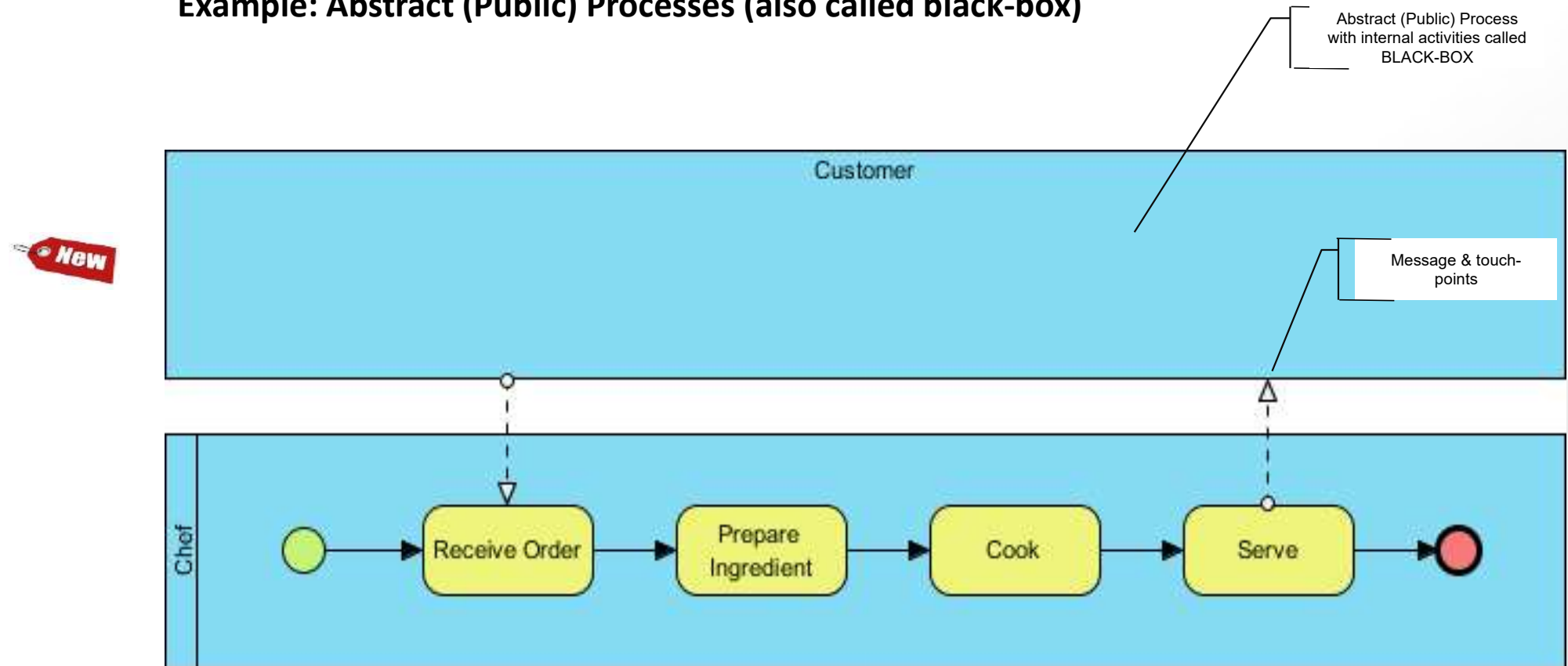
Only those activities that are used to communicate outside the private business process, plus the appropriate flow control mechanisms, are included in the abstract process.

All other “**internal**” activities of the private business process are not shown in the abstract process.

Thus, the abstract process shows to the outside world the sequence of messages that are required to interact with that business process.

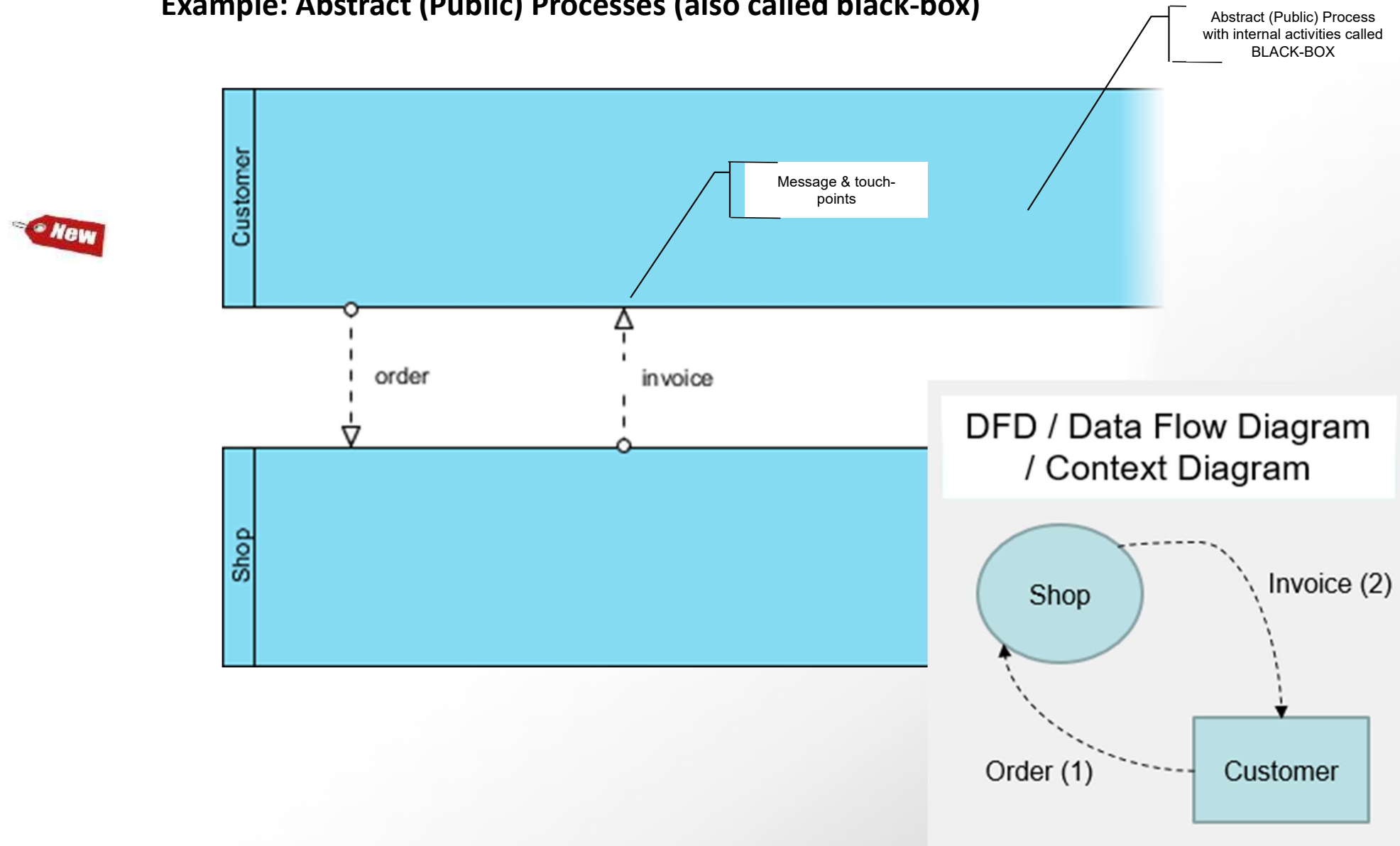
BPMN - Examples

Example: Abstract (Public) Processes (also called black-box)



BPMN - Examples

Example: Abstract (Public) Processes (also called black-box)



BPMN - Examples

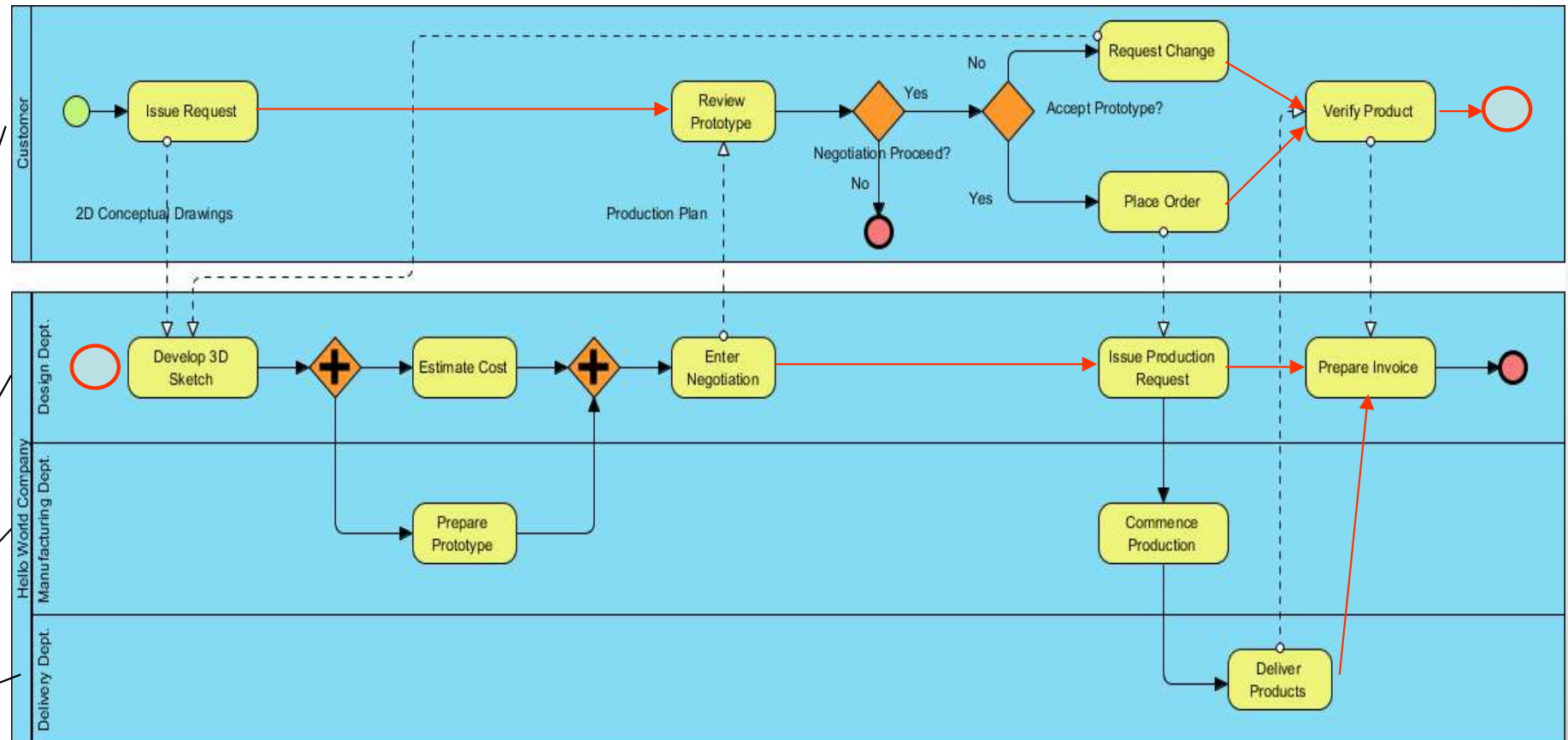
Example: Collaboration (Global) Processes

A collaboration process depicts the interactions between two or more business entities. These interactions are defined as a sequence of activities that represent the message exchange patterns between the entities involved.

The collaboration process can be shown as two or more abstract processes communicating with each other. With an abstract process, the activities for the collaboration participants can be considered the “touch-points” between the participants.

BPMN - Examples

Example: Collaboration (Global) Processes



Business
Entities

BPMN - Examples

Example: Collaboration (Global) Processes – Point of view

Since a BPMN Diagram may depict the Processes of different Participants, each Participant may view the Diagram differently.

That is, the Participants have different points of view regarding how the Processes will behave. Some of the activities will be internal to the Participant (meaning performed by or under control of the Participant) and other activities will be external to the Participant.

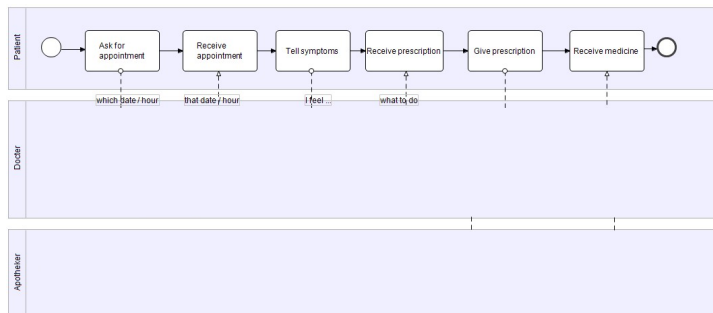
Each Participant will have a **different perspective** as to which are internal and external.

BPMN - Examples

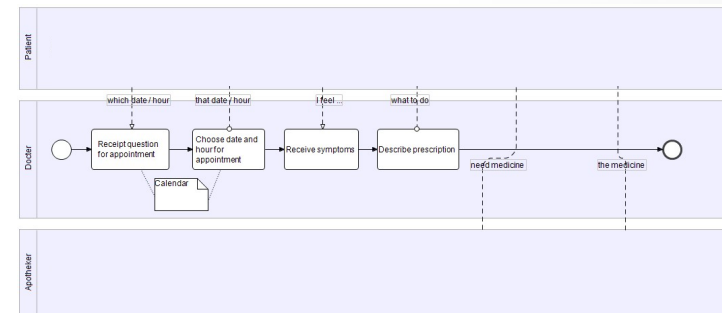
Example: Collaboration (Global) Processes – Point of view

Although the Diagram point of view is important for a viewer of the Diagram to understand how the behavior of the Process will relate to that viewer, BPMN will not currently specify any graphical mechanisms to highlight the point of view.

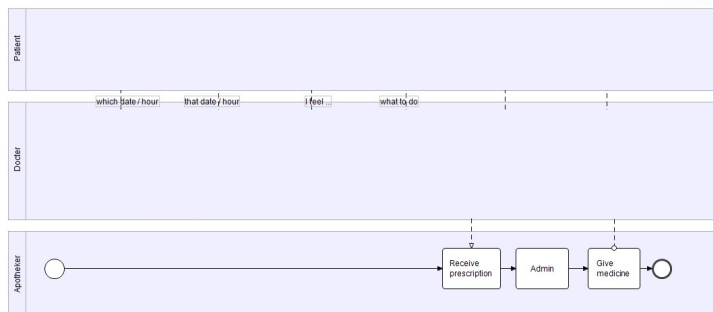
Point of View 'Patient'



Point of View 'Doctor'



Point of View 'Apotheker'



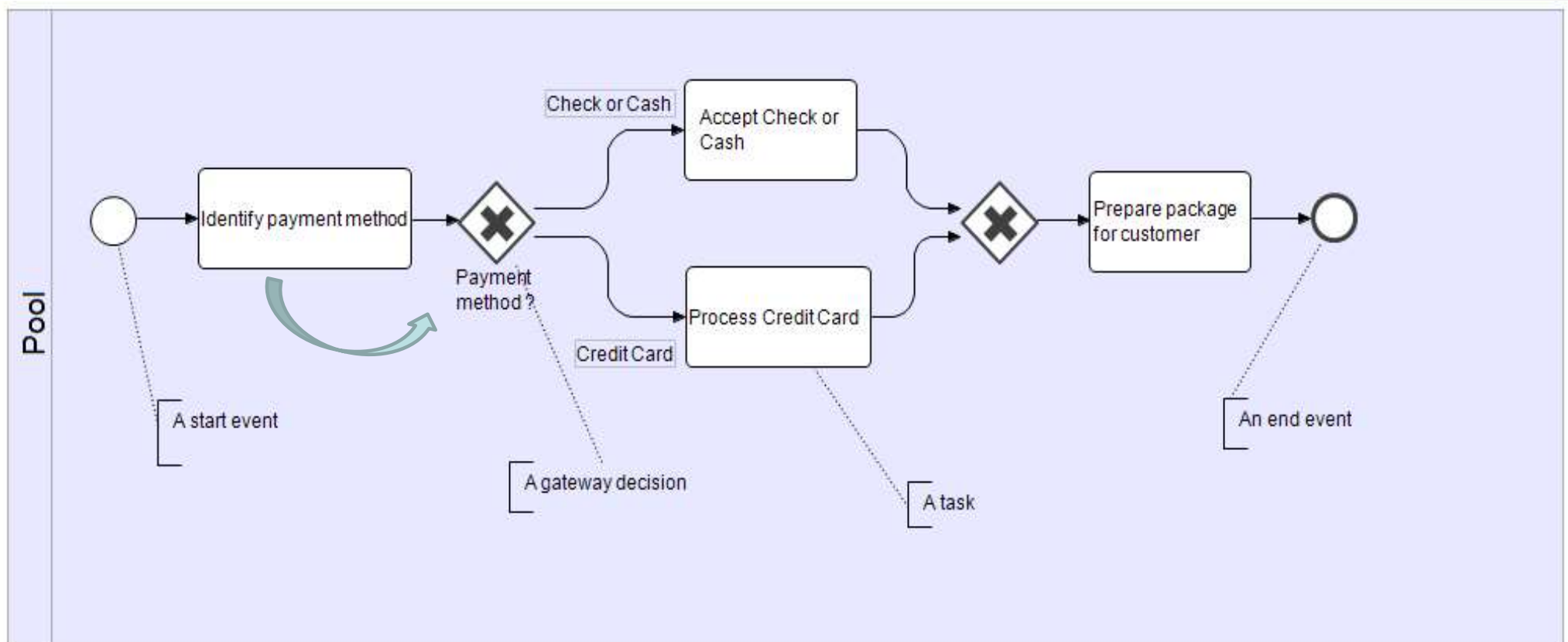
Every Business entity, models his business process **end-to-end**.

BPMN - Examples

Example: A gateway

The path that it flows out on is chosen based on condition expressions for each (XOR) gate of the gateway.

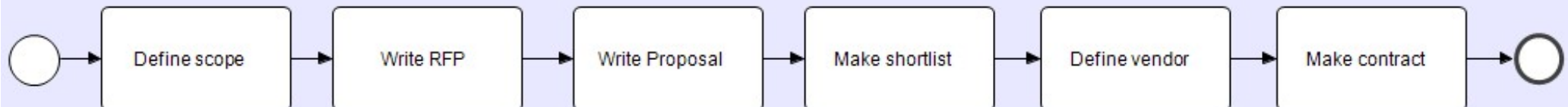
It can only go out on **one** flow.



BPMN - Orchestration

Orchestration

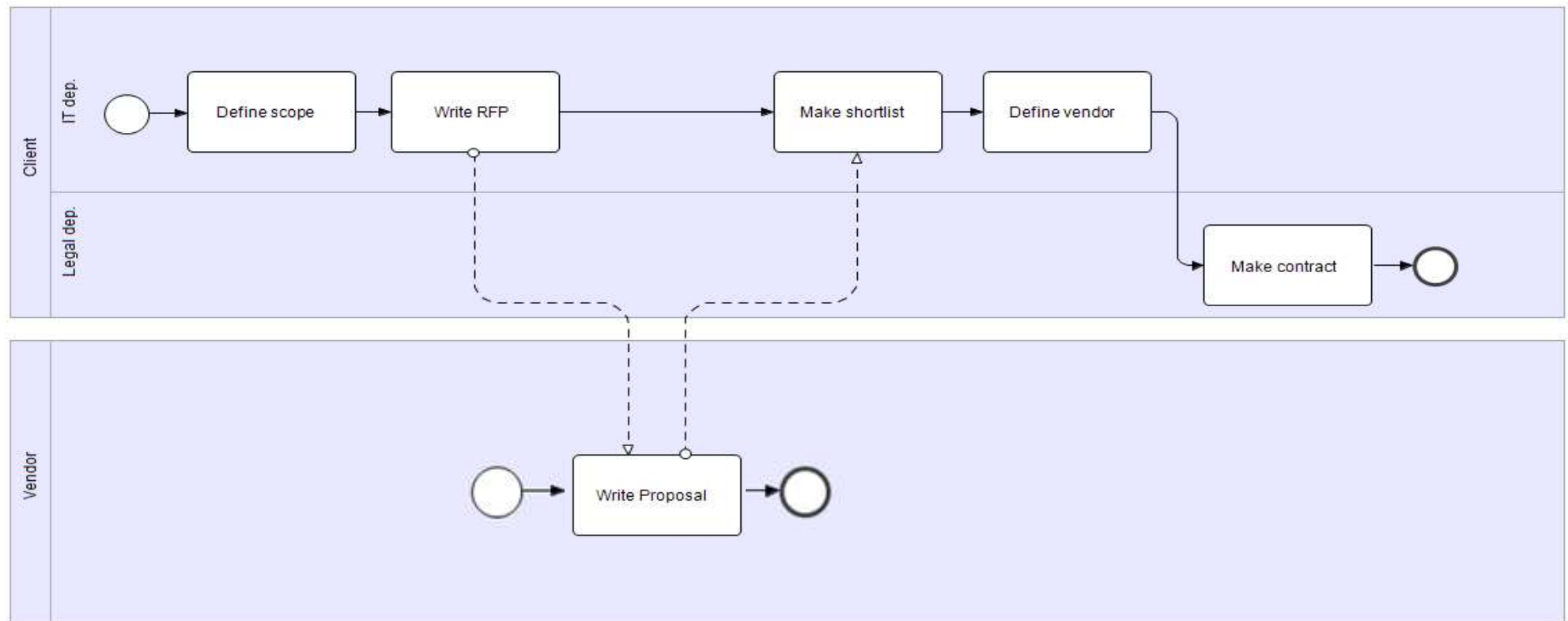
- Flow of control
- Represented by a sequence flow
- When one activity ends ...
... the next one starts ...



BPMN - Choreography

Choreography

- Communication between pools
 - Protocol ... not flow of control
 - All possible messages
 - requests, responses, ...
 - no specified order of messages



- The complete symbol SET of BPMN

The complete syntax of BPMN

The BPD Complete Set:

1. Flow Objects
2. Connecting Objects / Connectors
3. Swim lanes
4. Artifacts

Element	Description	Notation
Event	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 cause (trigger) or an impact (result). There are three types of Events, based on when they affect the flow: Start, Intermediate, and End.	 Name or Source
Flow Dimension (e.g., Start, Intermediate, End) Start (None, Message, Timer, Rule, Link, Multiple) Intermediate (None, Message, Timer, Error, Cancel, Compensation, Rule, Link, Multiple) End (None, Message, Error, Cancel, Compensation, Link, Terminate, Multiple)	As the name implies, the Start Event indicates where a particular process will start. Intermediate Events occur between a Start Event and an End Event. It will affect the flow of the process, but will not start or (directly) terminate the process. As the name implies, the End Event indicates where a process will end.	Start  Intermediate  End 

The complete syntax of BPMN

A Message event:



A message arrives from a participant and triggers the start of the Process.



A message arrives from a participant and triggers the Event. This causes the Process to continue if it was waiting for the message, or changes the flow for exception handling.

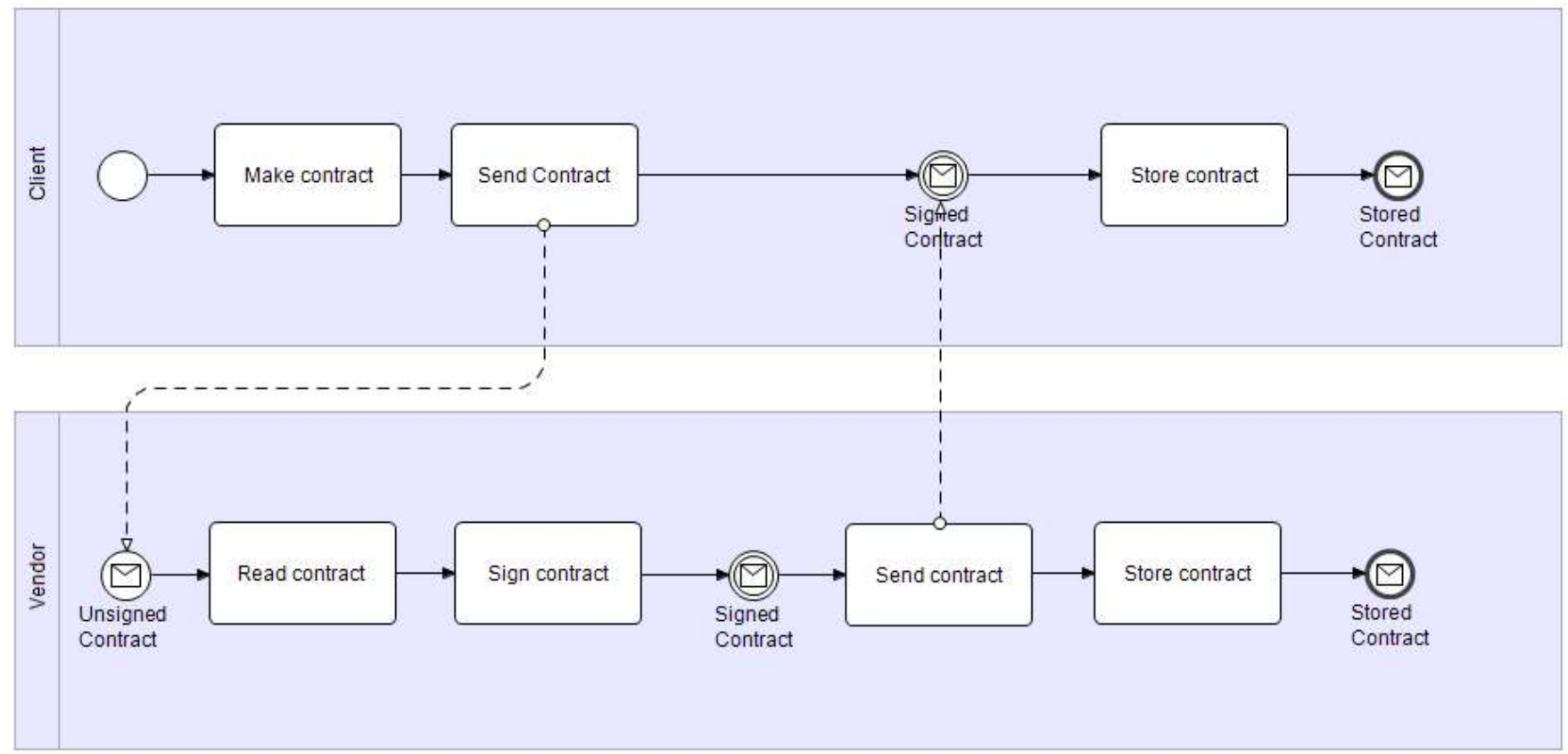


This type of End indicates that a message is sent to a participant at the conclusion of the Process.



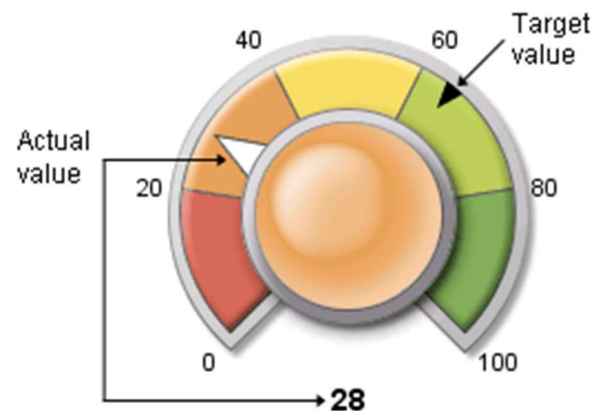
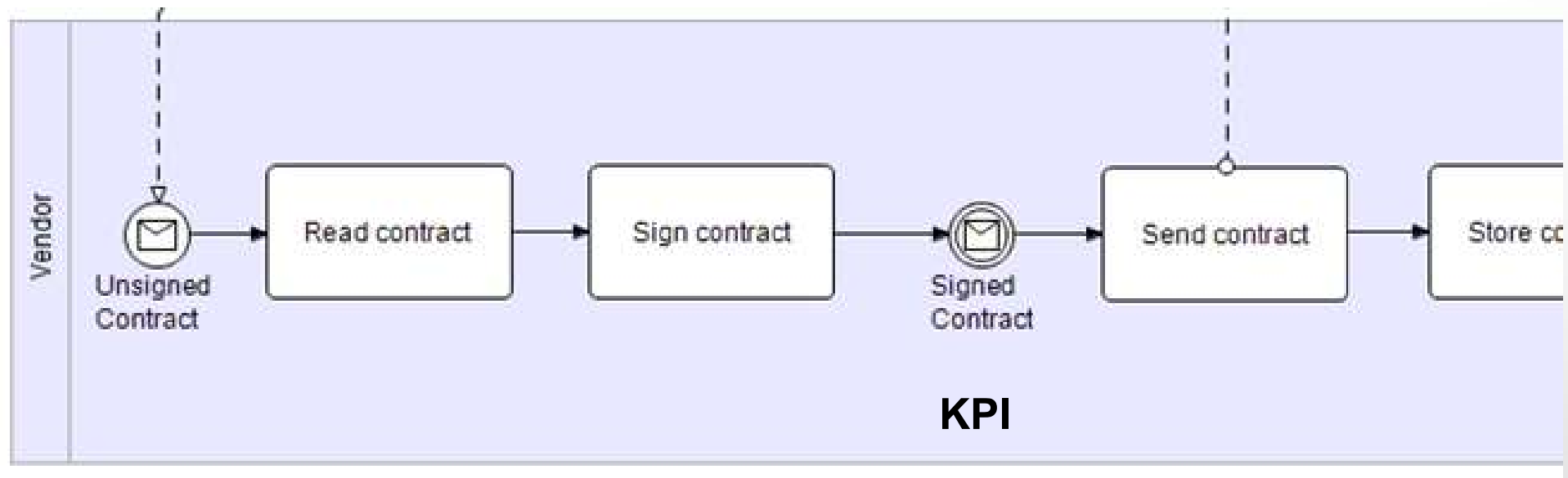
BPMN - Examples

Example: A Message event



BPMN - Examples

Example: A KPI / Key Performance Indicator with a Message event



The complete syntax of BPMN

Timer event:



A specific time-date or a specific cycle (e.g., every Monday at 9am) can be set that will trigger the start of the Process.



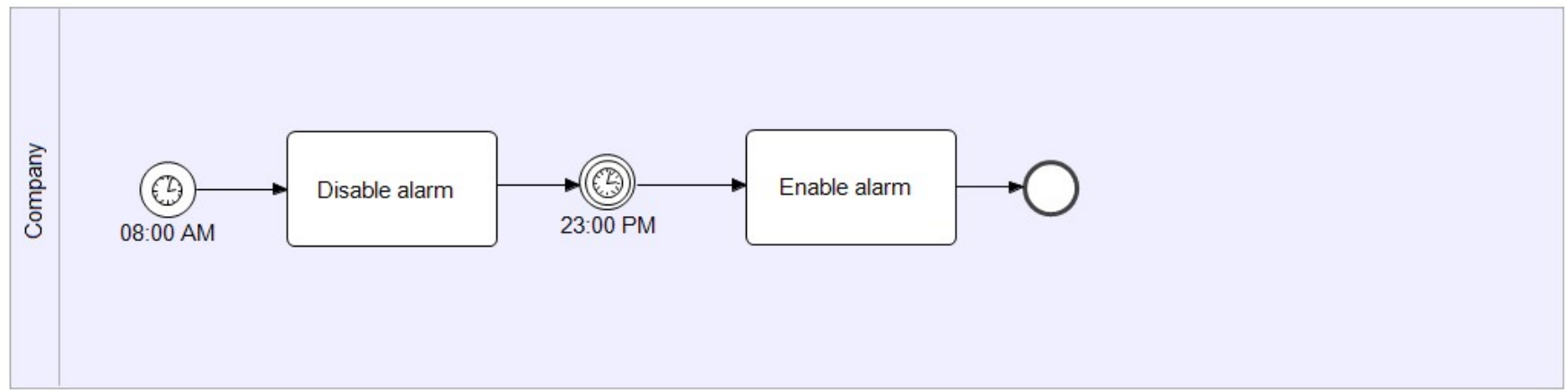
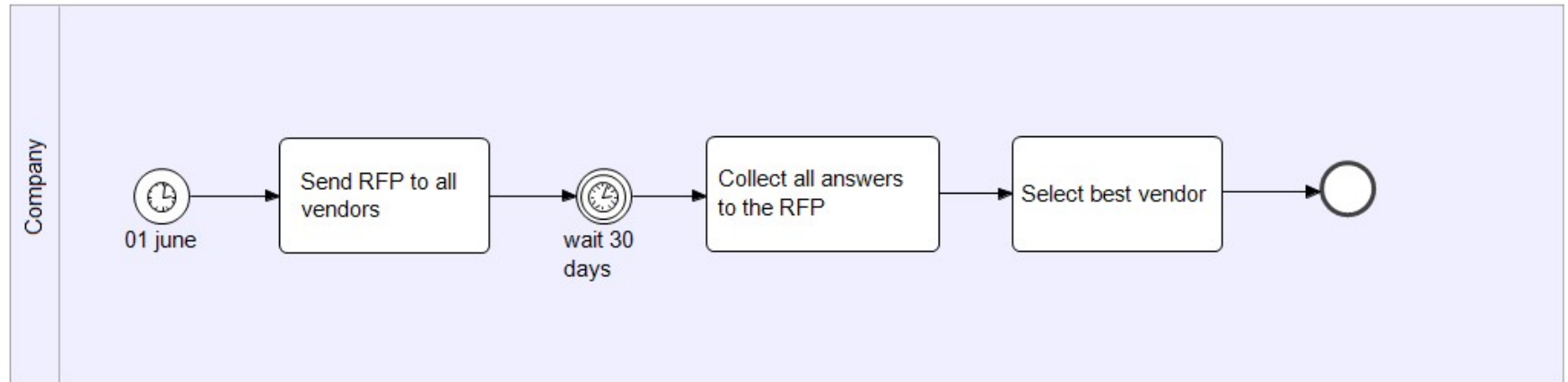
A specific time-date or a specific cycle (e.g., every Monday at 9am) can be set that will trigger the Event. If used within the main flow it acts as a delay mechanism.

A timer can not be an End Event.



BPMN - Examples

Example: Timer event



Is this correct ?

The complete syntax of BPMN

Error / Exception event

Error / Exception can not be an Start Event.



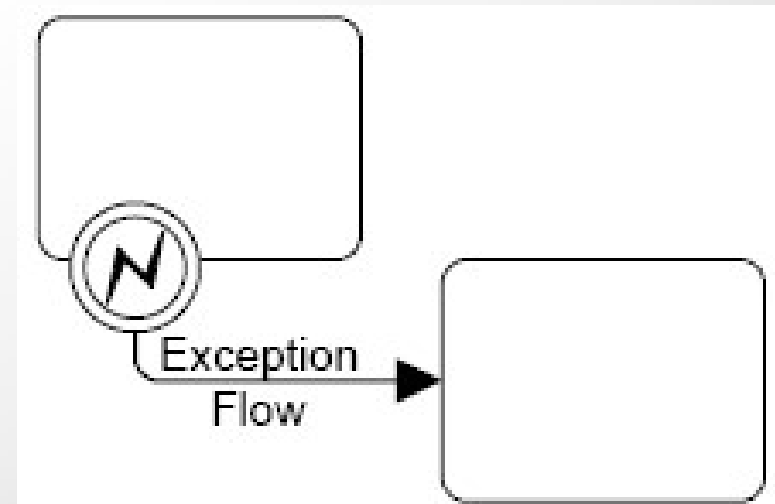
This is used for error handling--both to set (throw) and to react to (catch) An errors. It sets (throws) an error if the Event is part of a Normal Flow. It reacts to (catches) a named error, or to any error if a name is not specified, when attached to **the boundary of an activity**.



This type of End indicates that a named Error **should be generated**. This Error will be caught by an Intermediate Event within the Event Context.

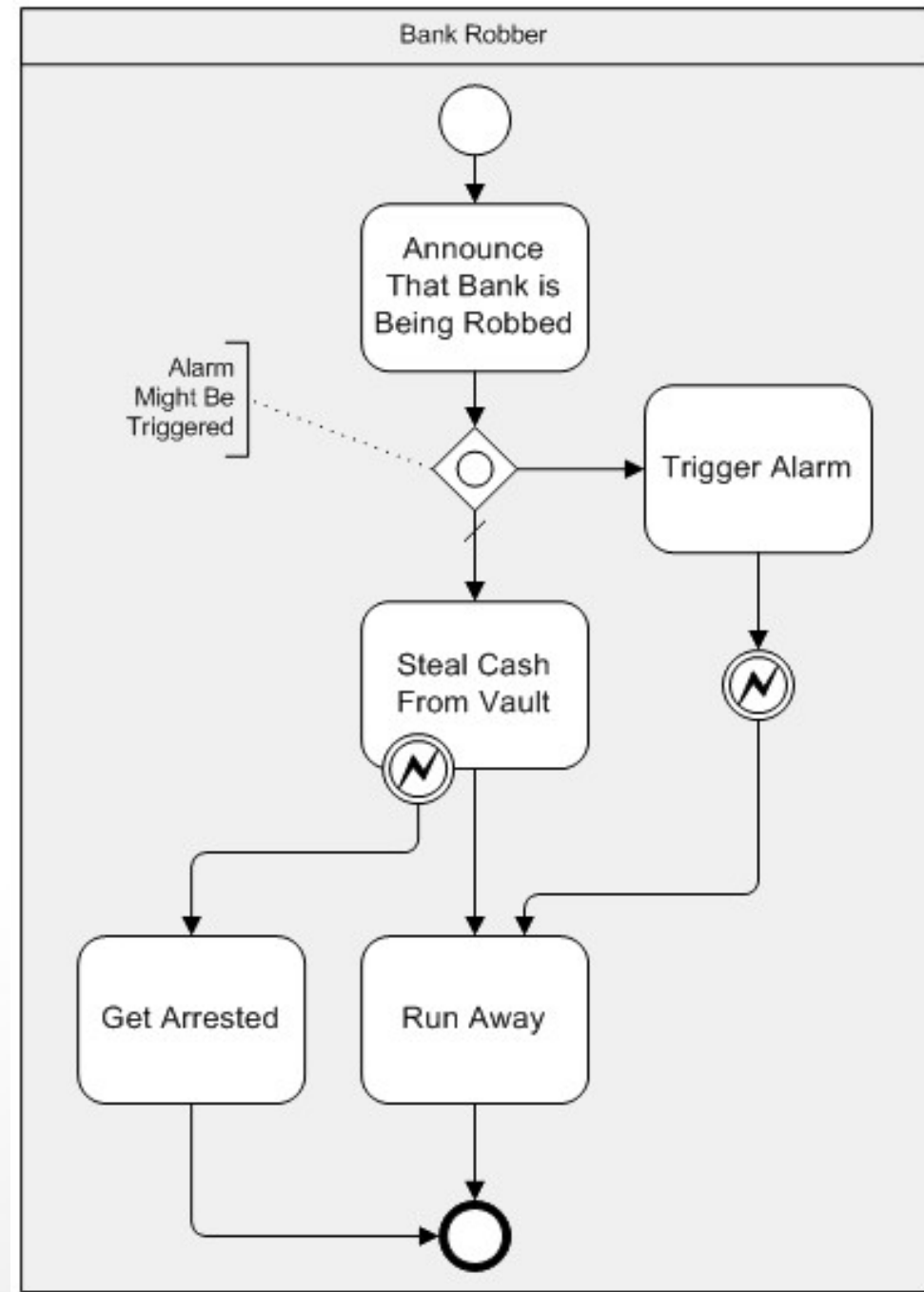


Exception Flow occurs outside the Normal Flow of the Process and is based upon an Intermediate Event that occurs during the performance of the Process.



BPMN - Examples

Example: Error / Exception event



The complete syntax of BPMN

Conditional (or Rule) event:



This type of event is triggered when the conditions for a conditional event such as “S&P 500 changes by more than 10% since opening,” or “Temperature above 300C” become true.



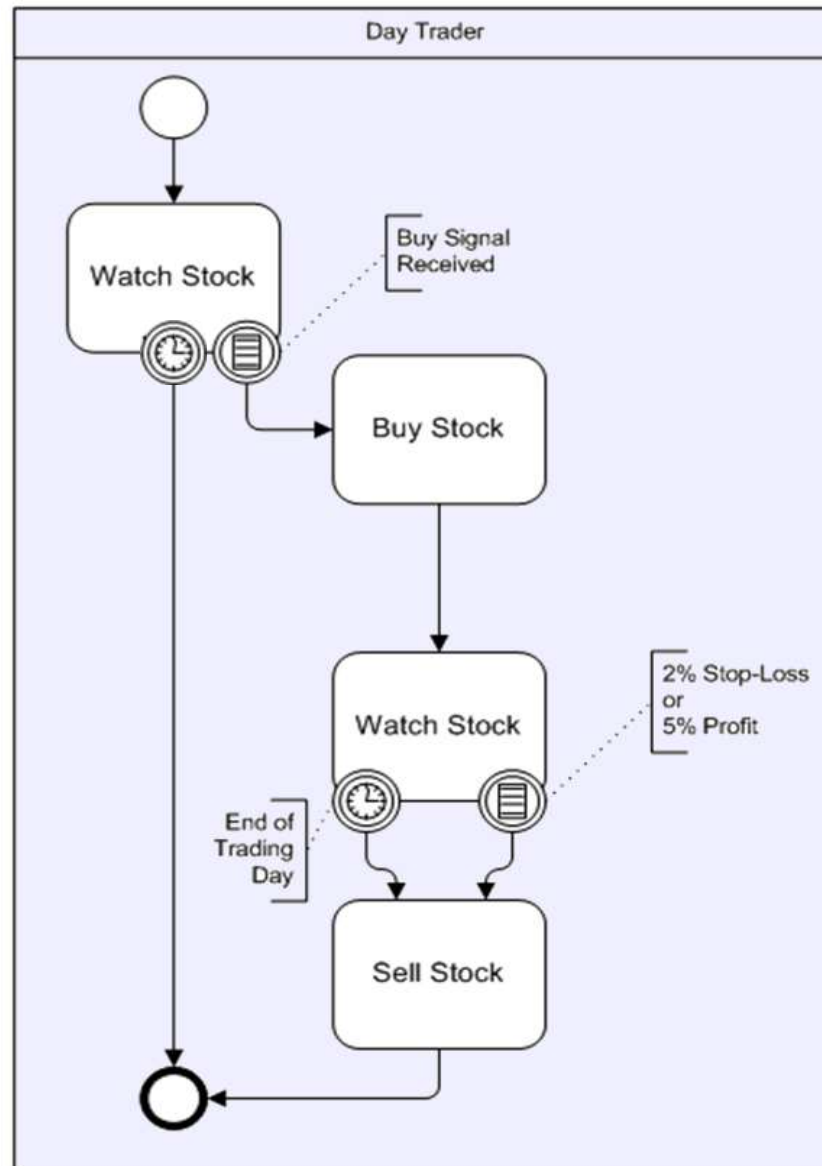
This type of event is triggered when a conditional event becomes true. A conditional event is an expression that evaluates some Process data.

A conditional event can not be an End Event



BPMN - Examples

Example: Conditional events



Example - Modeling of a day trader

An intermediate conditional event was used to prevent excessive losses or lock in a target gain on the stock transaction.

An intermediate timer event was used to force the day trader to sell the stock at the end of the day, if he had not already done so.

The complete syntax of BPMN

Compensation event:

A compensation can not be an Start Event.



This is used for compensation handling. There are times in business process modeling where we need the ability to “undo” a step or process. Sometimes, when undoing, we actually want to record that something has been undone, which requires a separate process step (represented as a task). It is not a roll-back!



This type of End will indicate that a Compensation is **necessary**. The Compensation identifier will trigger an Intermediate Event when the Process is rolling back.



This type of End will indicate the Compensation **itself**. The compensation task is represented as a normal task, but with a small symbol that looks like the rewind-button on an audio player (two small solid triangles pointed to the left).

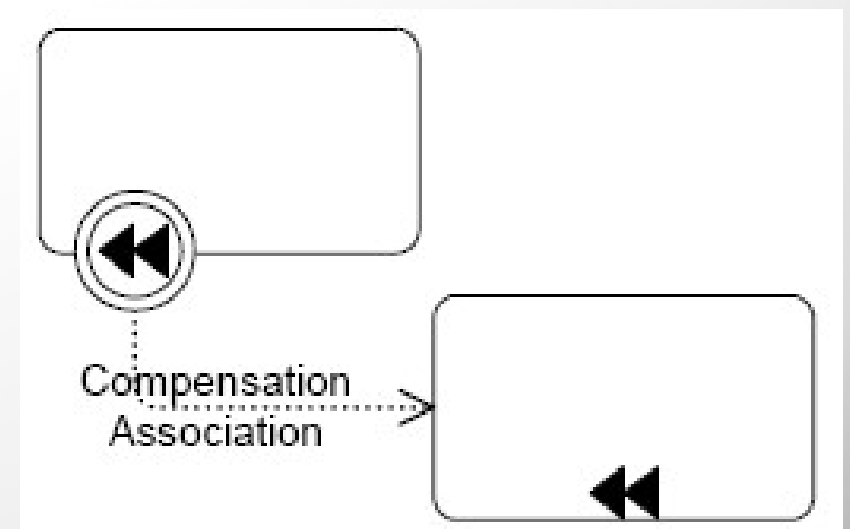
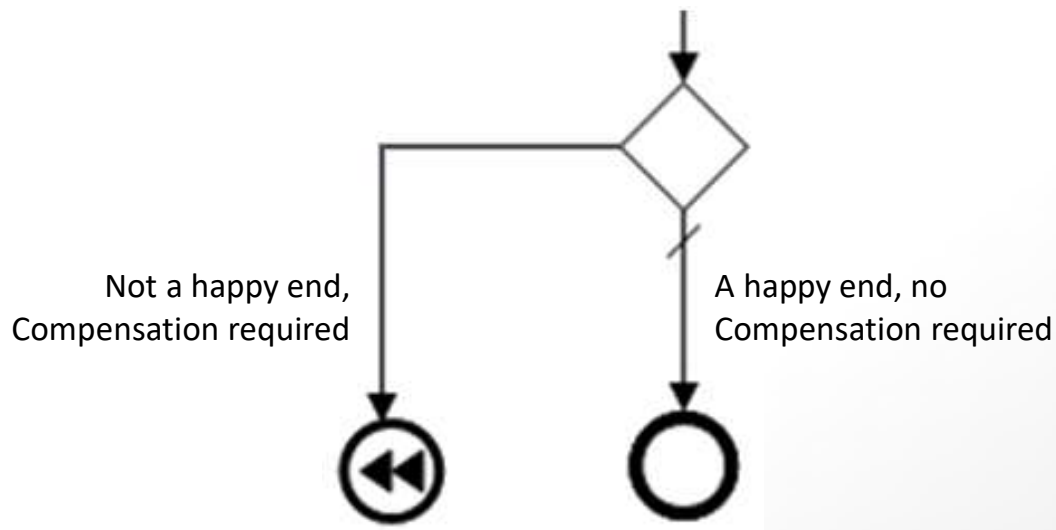


The complete syntax of BPMN

Compensation event:

Compensation Association

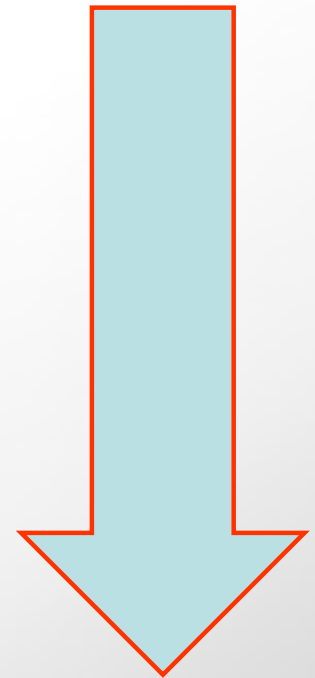
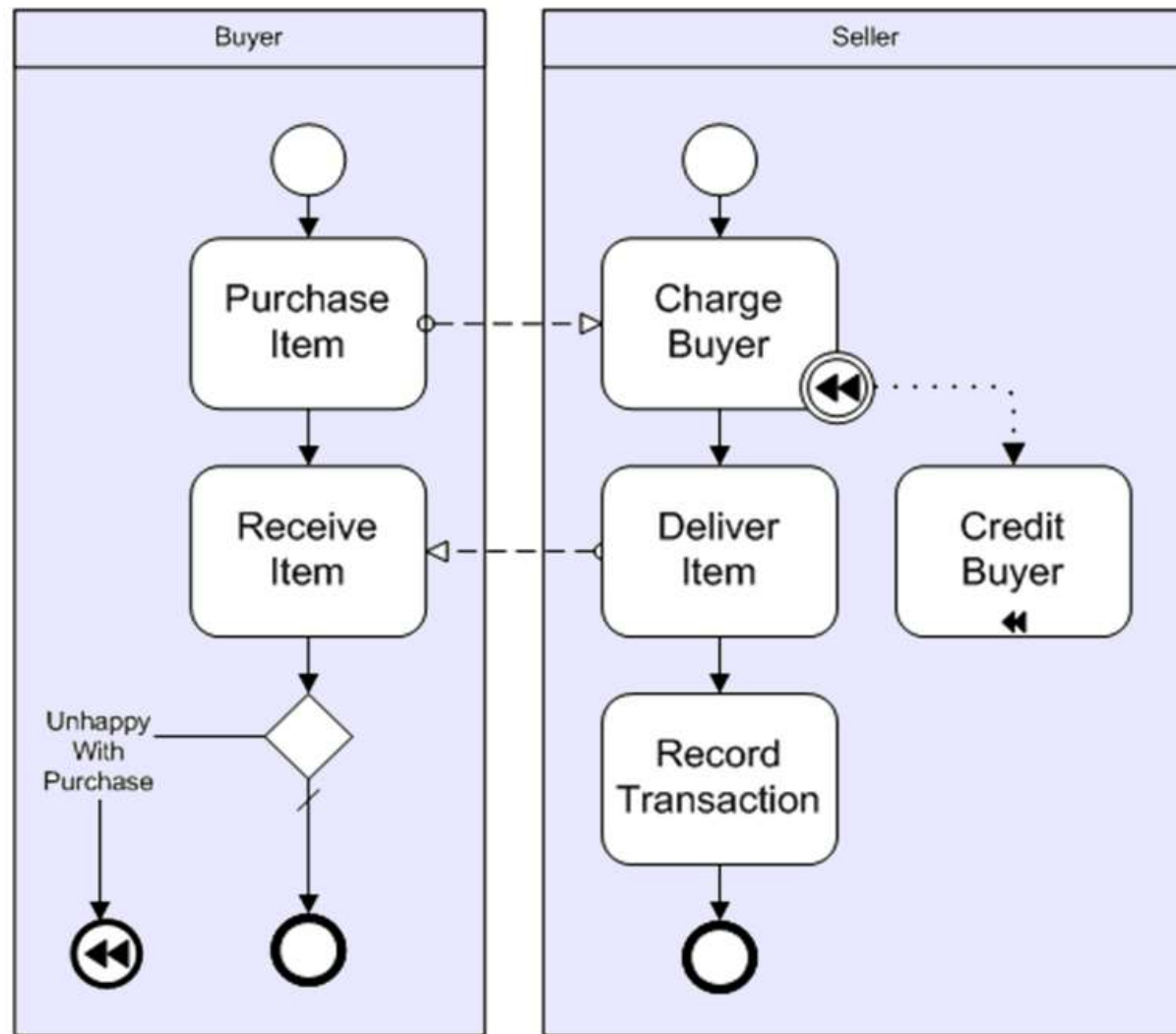
Occurs outside the Normal Flow of the Process and is based upon an event (a Cancel Intermediate Event) that is triggered through the failure of a Transaction or a Compensate Event. The target of the Association must be marked as one Compensation Activity.



BPMN - Examples

Example: Compensation event

Interaction between a Buyer and a Seller



The complete syntax of BPMN

Cancel event:

A Cancel can not be an Start Event.



This type of Intermediate Event is used within a Transaction Sub-Process. This type of event **MUST** be attached to the **boundary of a Sub-Process**. It **SHALL** be triggered if a Cancel End Event is reached within the Transaction Sub-Process. It also **SHALL** be triggered if a Transaction Protocol “Cancel” message has been received while the Transaction is being performed.

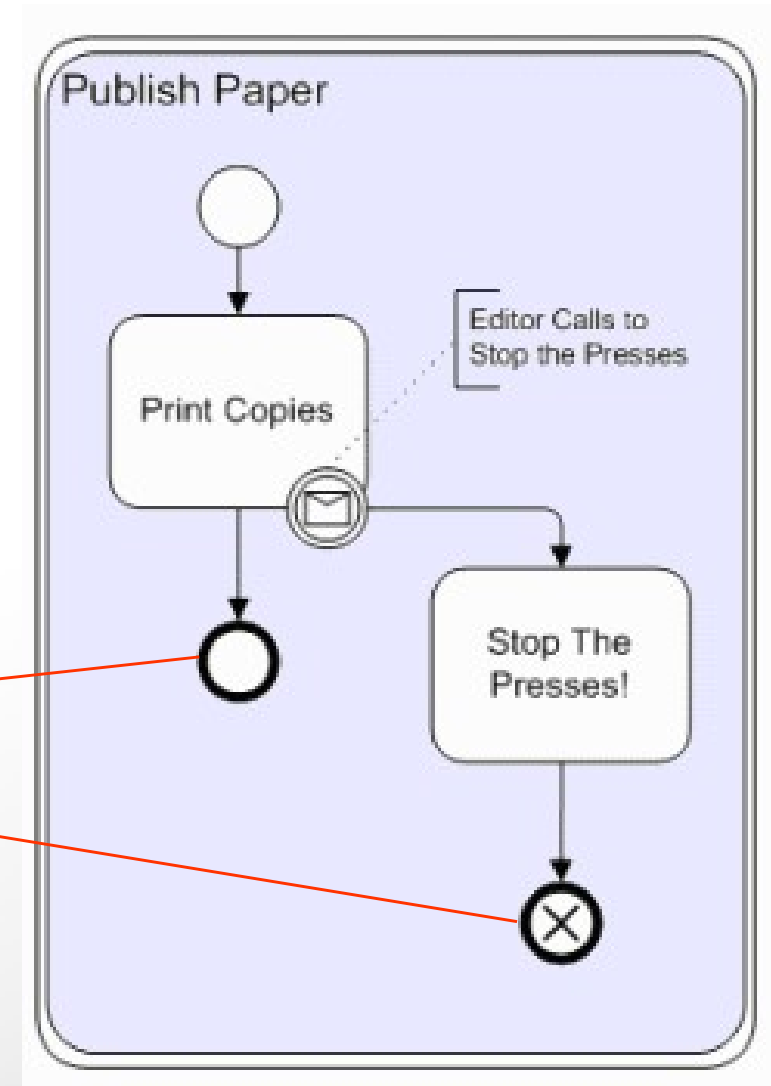
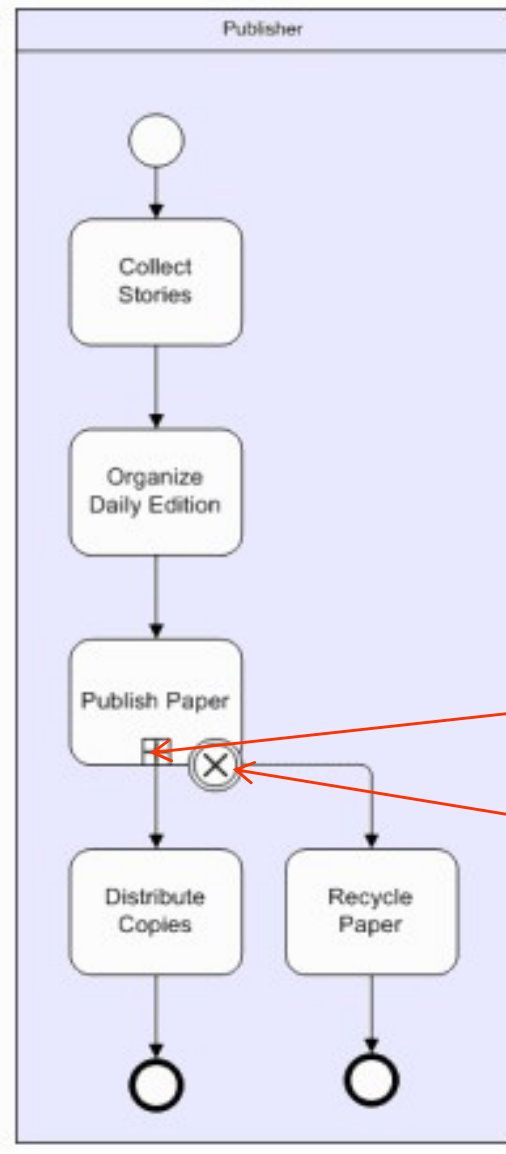


This type of End is used **within a Transaction Sub-Process**. It will indicate that the Transaction should be cancelled and will trigger a Cancel Intermediate Event attached to the Sub-Process boundary. In addition, it will indicate that a Transaction Protocol Cancel message should be sent to any Entities involved in the Transaction.



BPMN - Examples

Example: Cancel event



The complete syntax of BPMN

Link event:

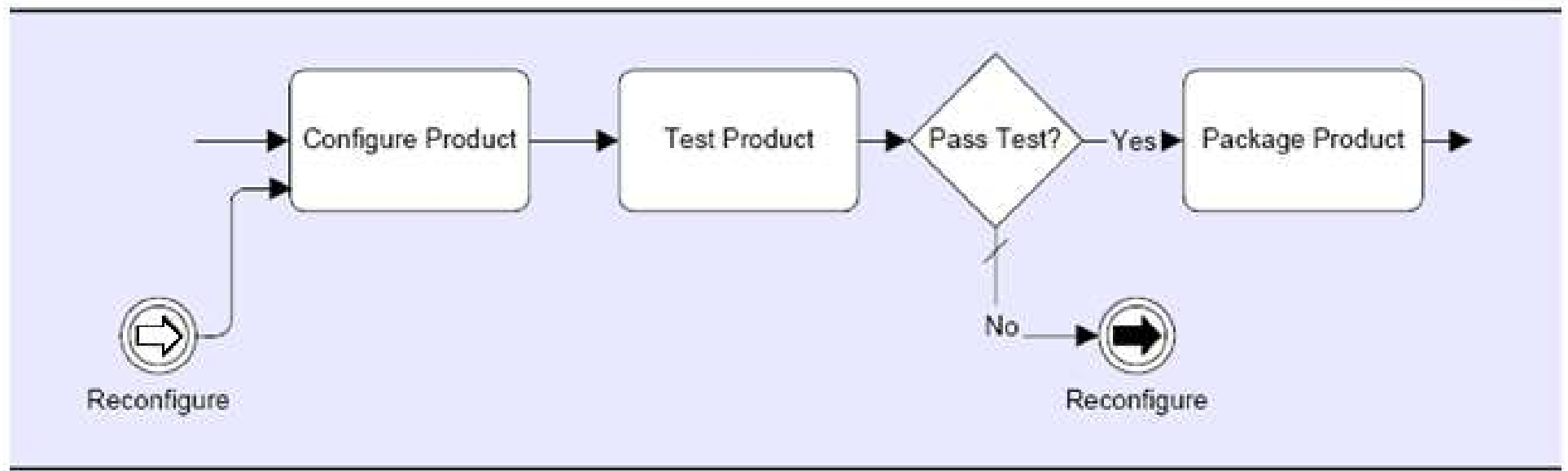


A Link is a mechanism for connecting an End Event (Result) of one Process to an Intermediate Event (Trigger) in another Process. Paired Intermediate Events can also be used as “**Go To**” objects within a Process.



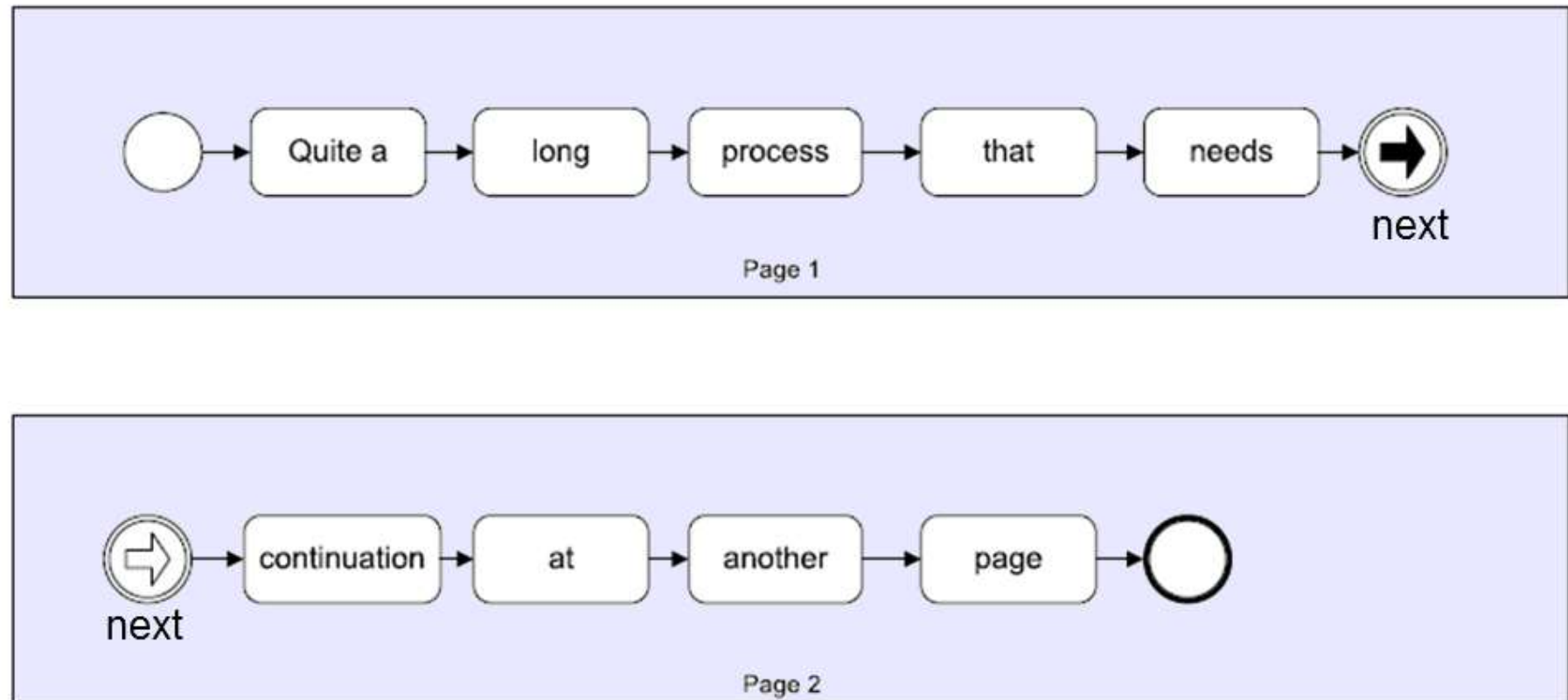
BPMN - Examples

Example: Link event



BPMN - Examples

Example: Link event



The complete syntax of BPMN

Terminate event:

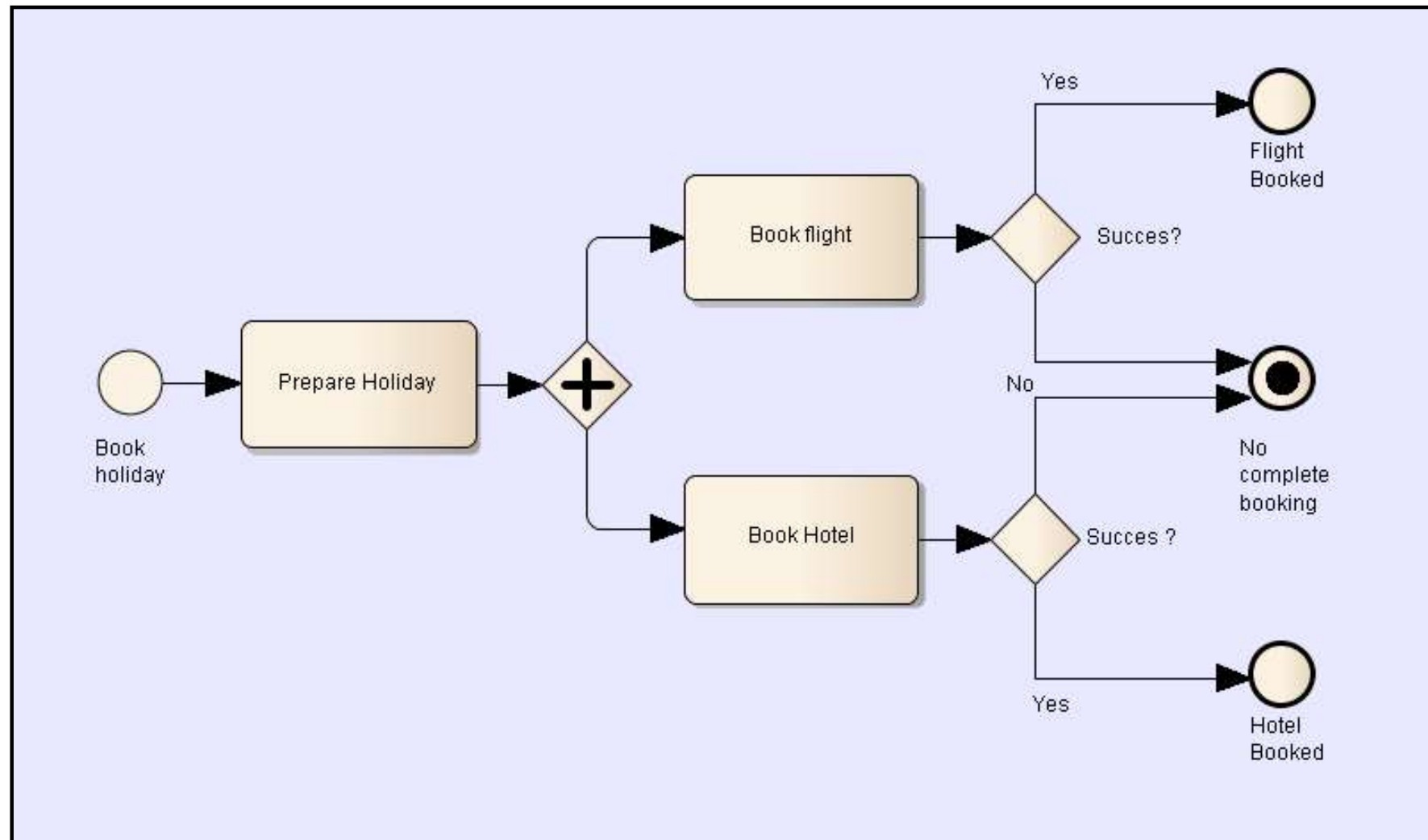


This type of End indicates that **all activities** in the Process should be immediately ended. This includes all instances of Multi-Instances. The Process is ended without compensation or event handling.



BPMN - Examples

Example: Terminate event



The complete syntax of BPMN

Multiple event:



This means that there are **multiple ways of triggering** the Process. Only one of them will be required to start the Process. The attributes of the Start Event will define which of the other types of Triggers apply. Additional notes or documentation will indicate the possible starting events.



This means that there are multiple ways of triggering the Event. Only **one** of them will be required. The attributes of the Intermediate Event will define which of the other types of Triggers apply.

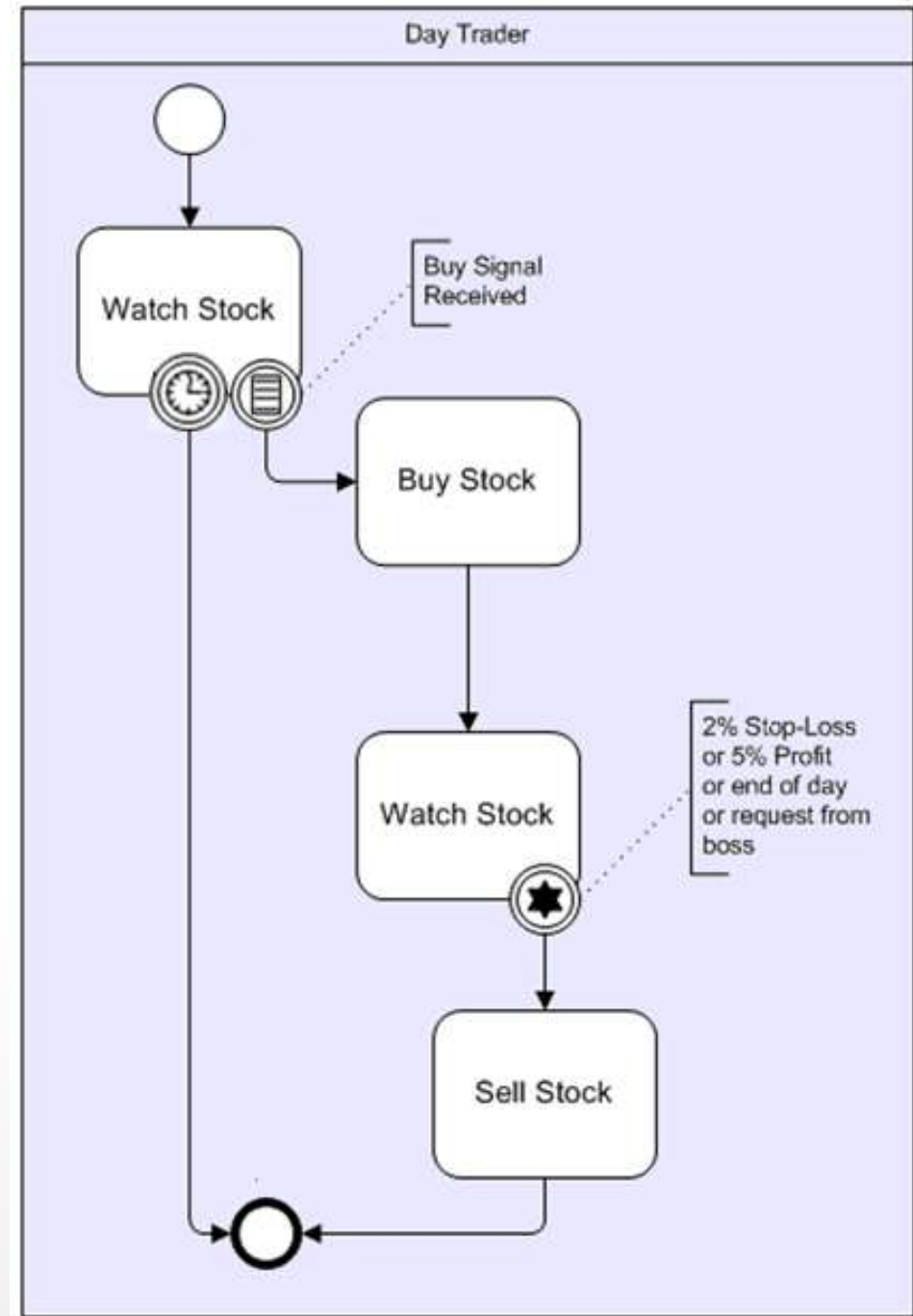


This means that there are **multiple consequences** of ending the Process.



BPMN - Examples

Example: Multiple event



The complete syntax of BPMN

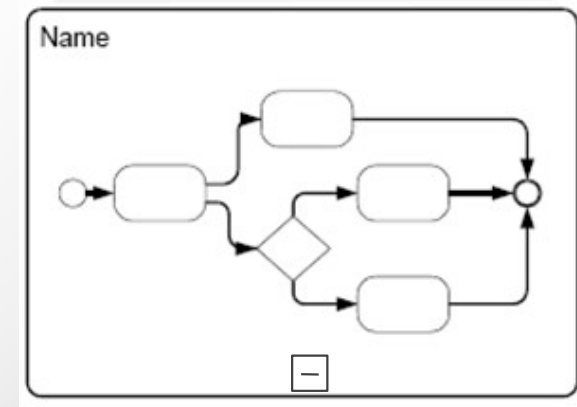
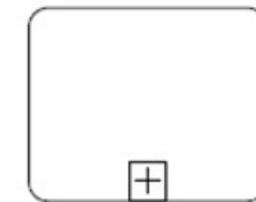
Task:

A **Task** is an atomic activity that is included within a Process.

Collapsed Sub-Process is a Sub-Process that Hides its flow details. The Collapsed Sub-Process object uses a marker to distinguish it as a Sub-Process, rather than a Task. The marker is a small square with a plus sign (+) inside.

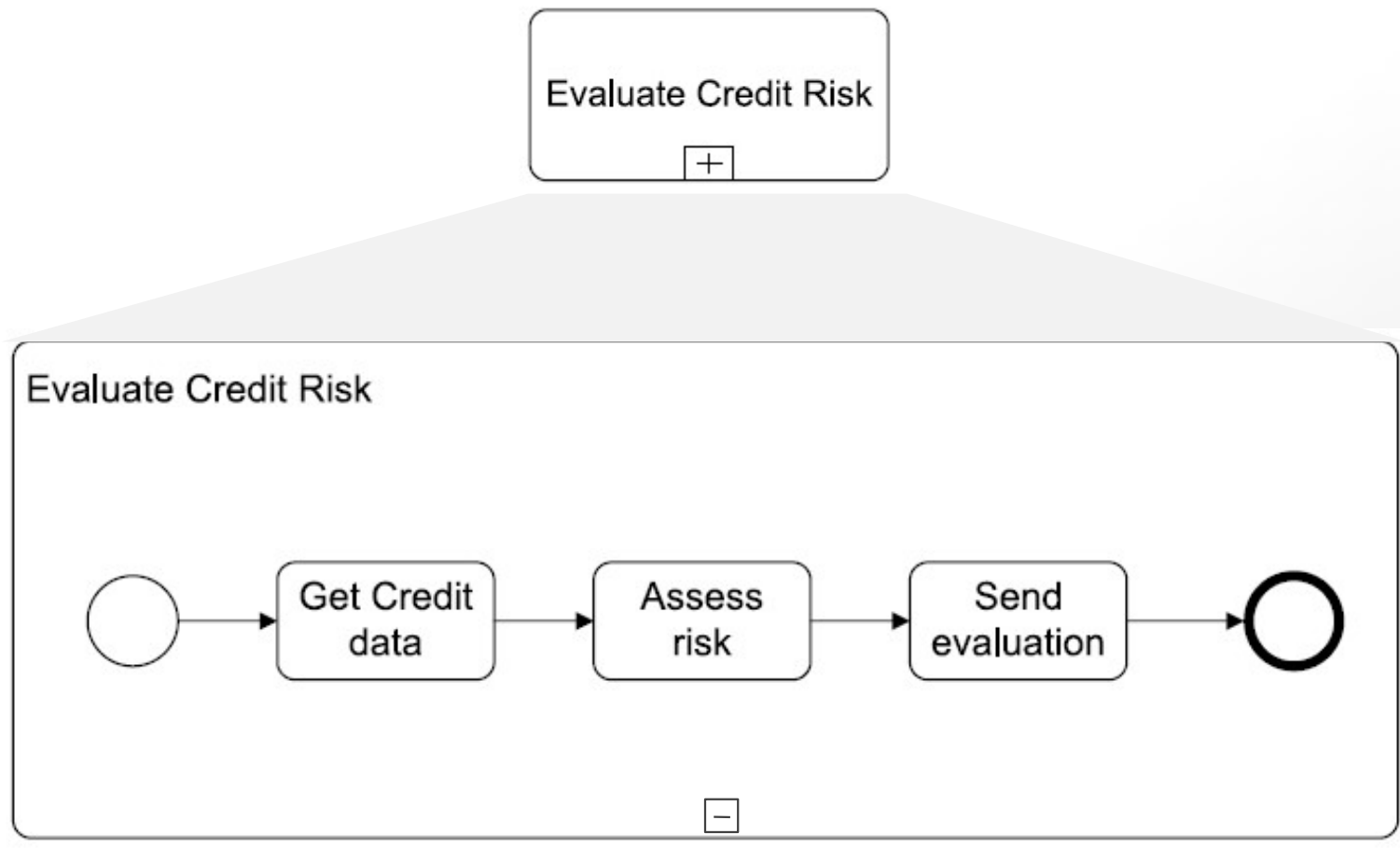
Expanded Sub-Process may be used for multiple purposes. They can be used to “**flatten**” a hierarchical process so that all detail can be shown at the same time.

They are used to create a context for exception handling that applies to a group of activities, compensations can be handled similarly.



BPMN - Examples

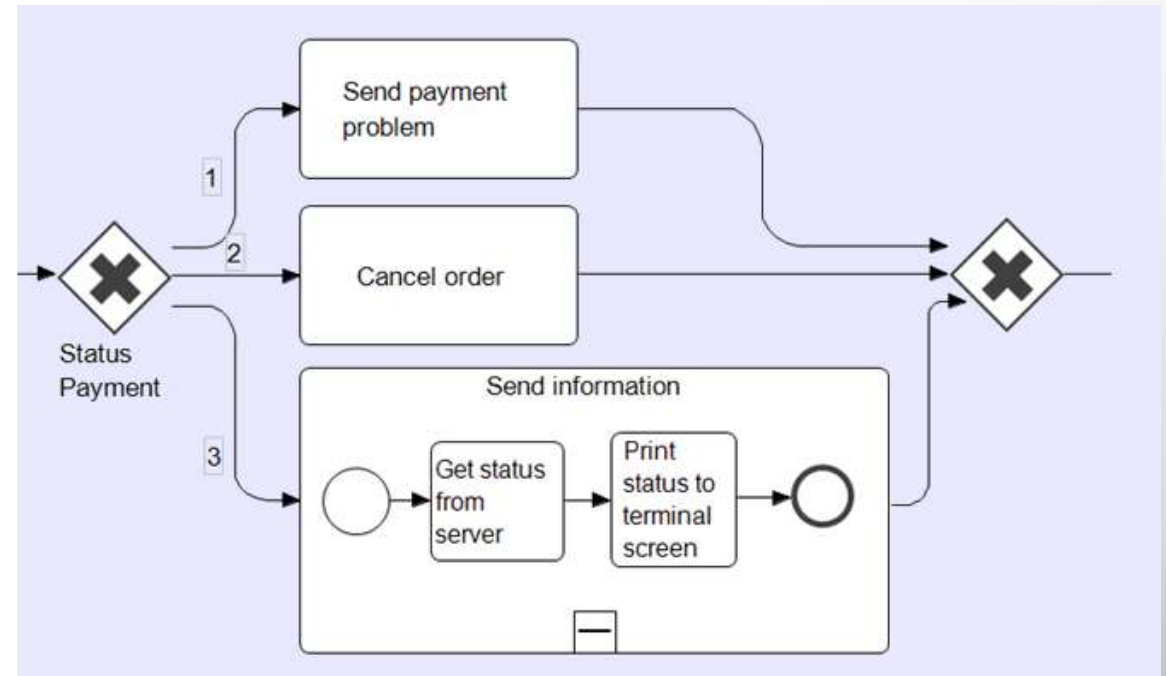
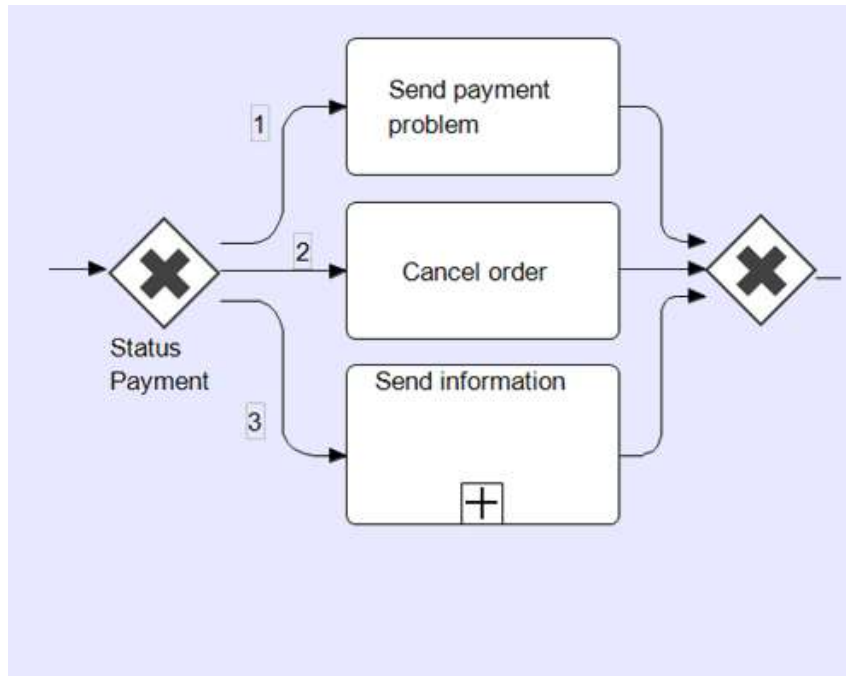
Example: Collapsed Sub-Process versus Expanded Sub-Process



BPMN - Examples

Example: Concept of Sub-Process decomposition

With the ' + ' you can view a BPMN Business Process diagram and quickly see which processes are complex, and that decompose to further levels.



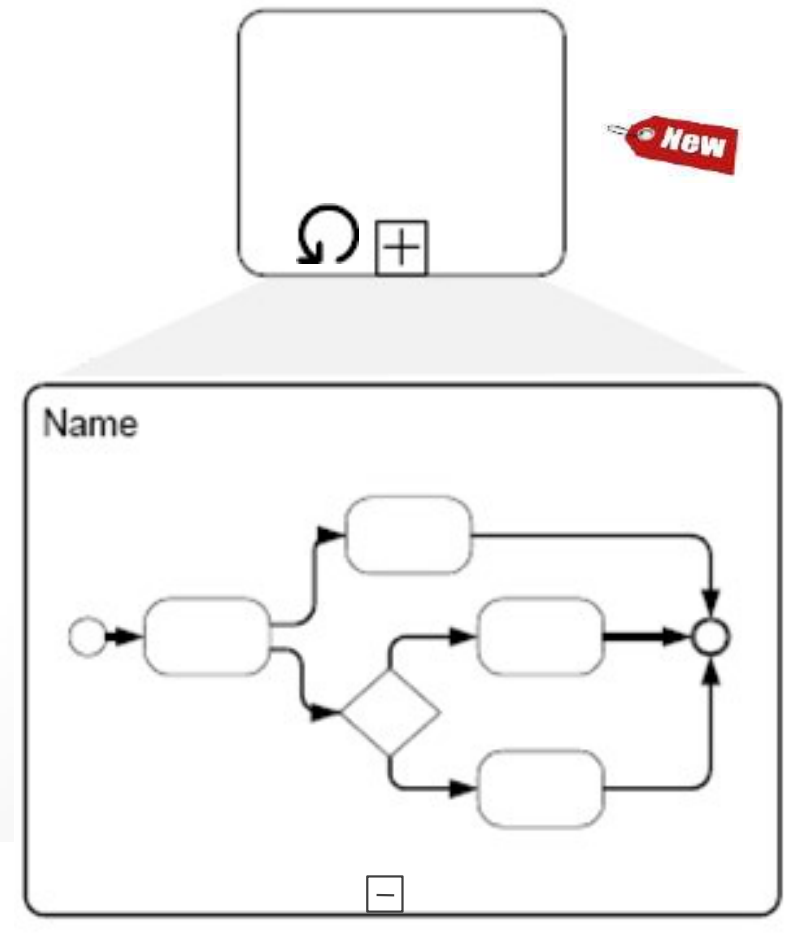
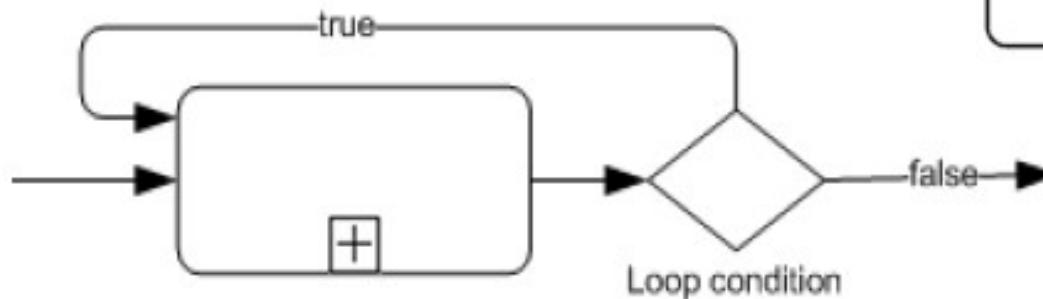
The complete syntax of BPMN

Repeating Sub-Process (sequential execution)

Is performed until condition is true.

- Number of iterations **not known** in advance
- Number of iterations is minimum 1
- Perform the activity once and then test a loop condition

Is the same as:



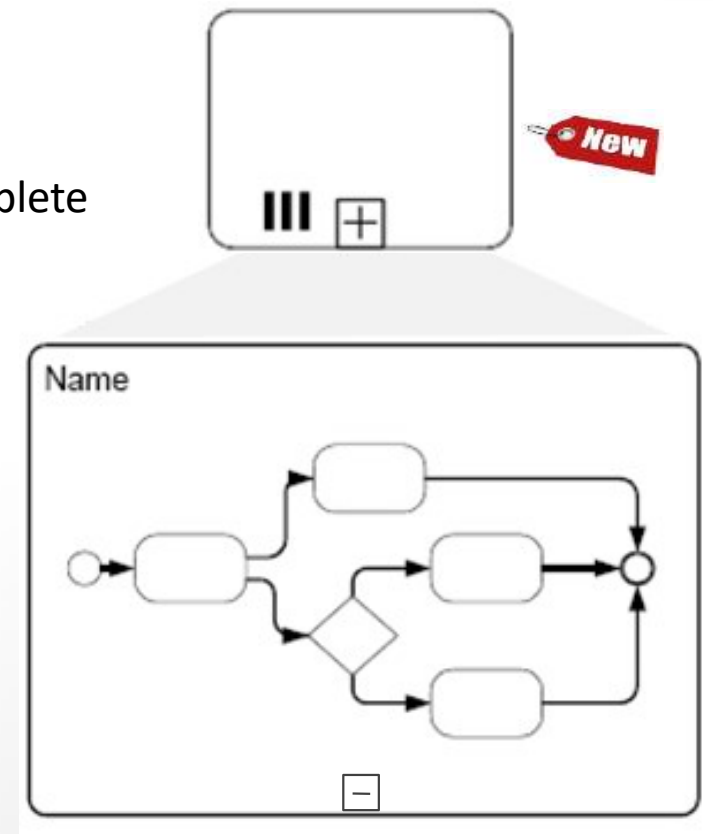
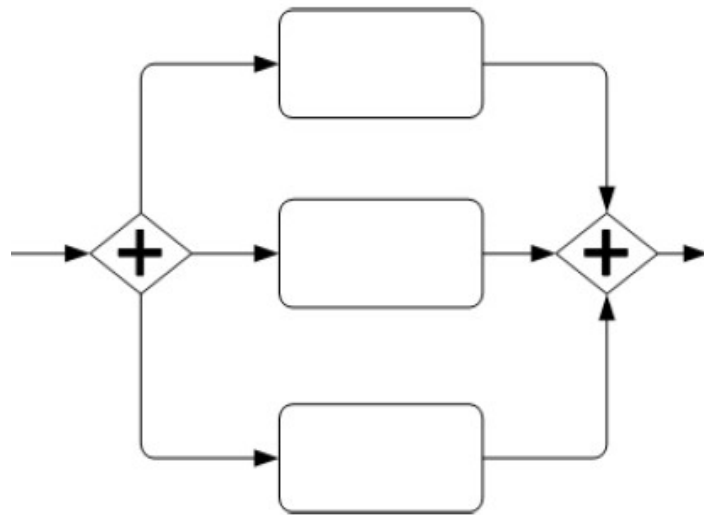
The complete syntax of BPMN

Multiple Instance Sub-Proces (parallel execution)

Is performed until condition is true.

- Perform the activity **N** times
- Activity is complete when all N iterations are complete

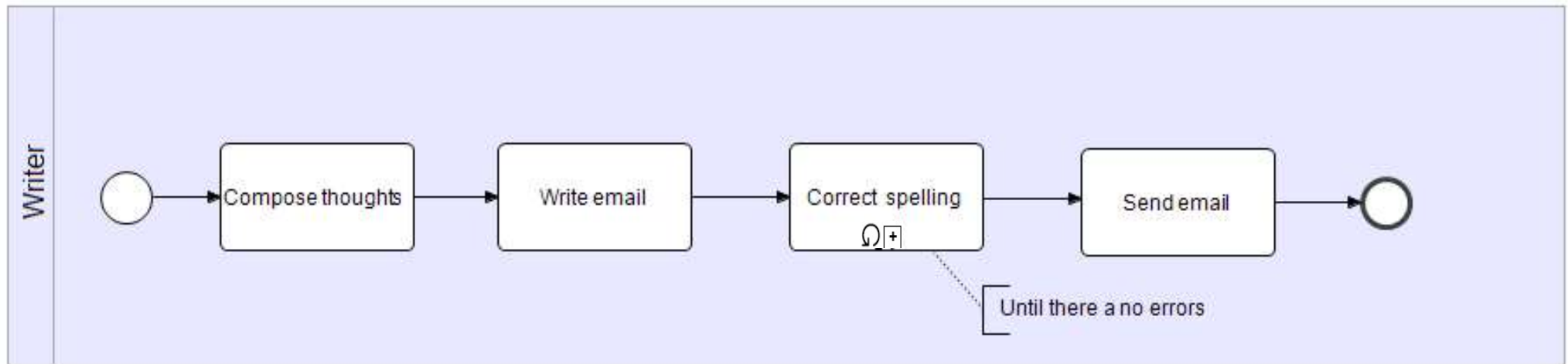
Is the same as:



BPMN - Examples

Example: Execute Collapsed Sub-Process several times

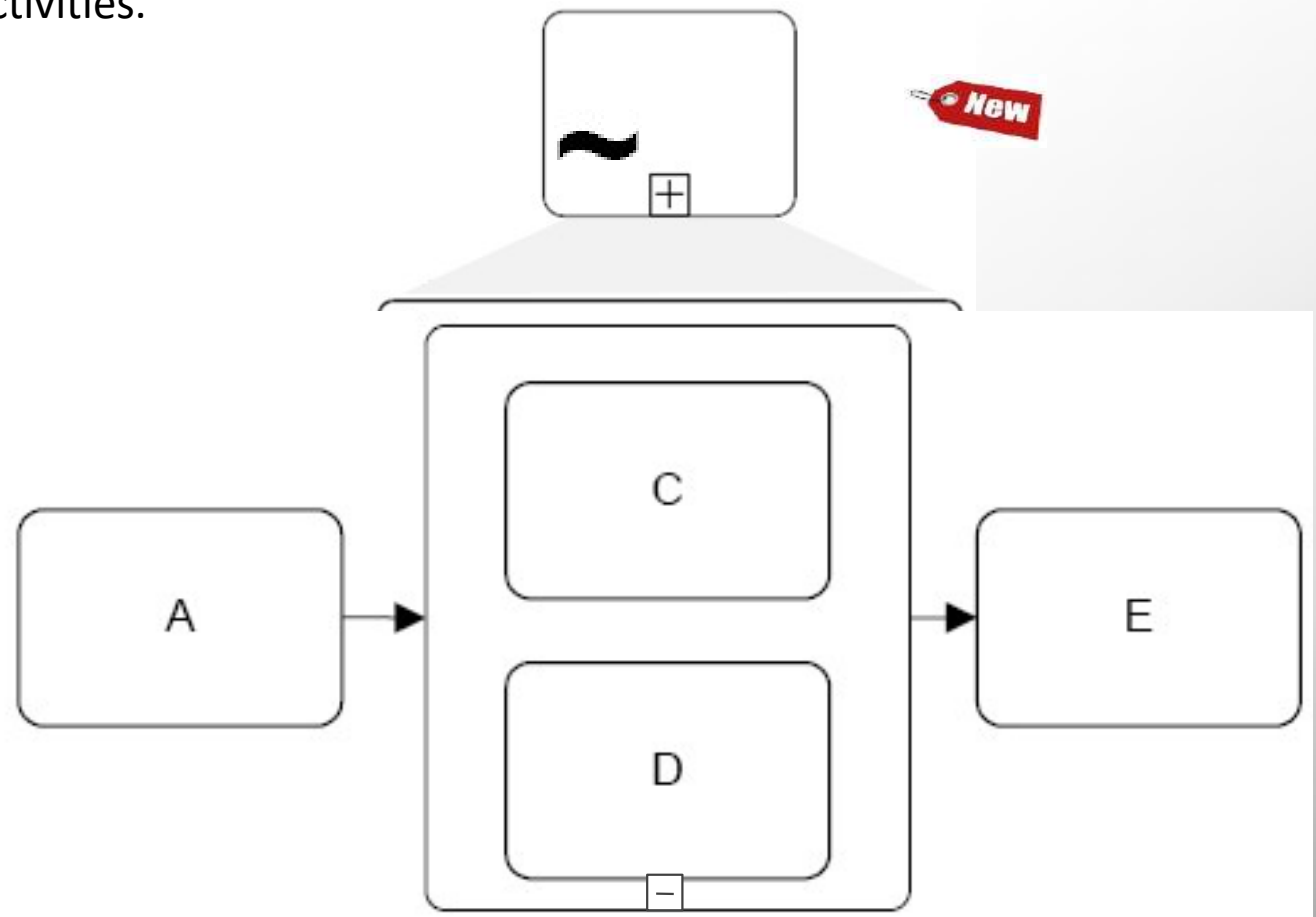
Repeat until condition ...



The complete syntax of BPMN

Ad-hoc Sub-Process

The activities within an Ad Hoc Embedded Sub-Process are not controlled or sequenced in a particular order, there performance is determined by the performers of the activities.



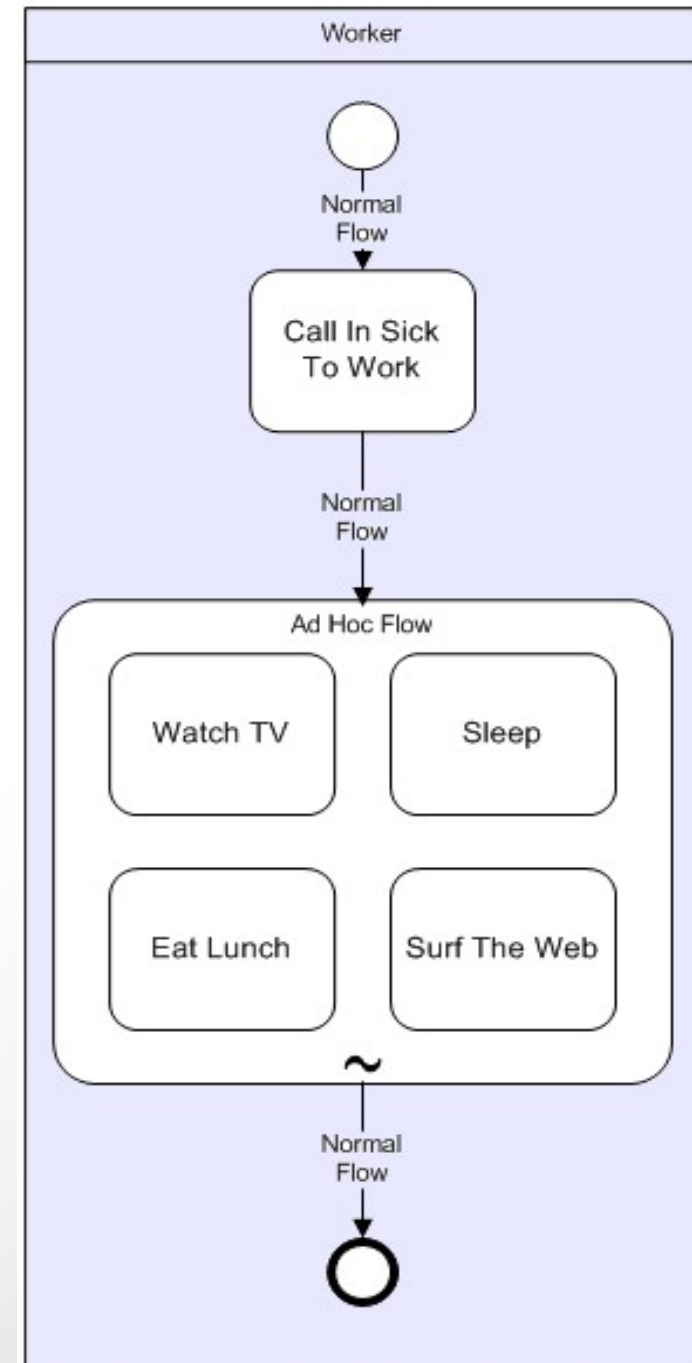
BPMN - Examples

Example: Ad-hoc Sub-Process

The following example shows the unstructured day of our worker if she were to call in sick.

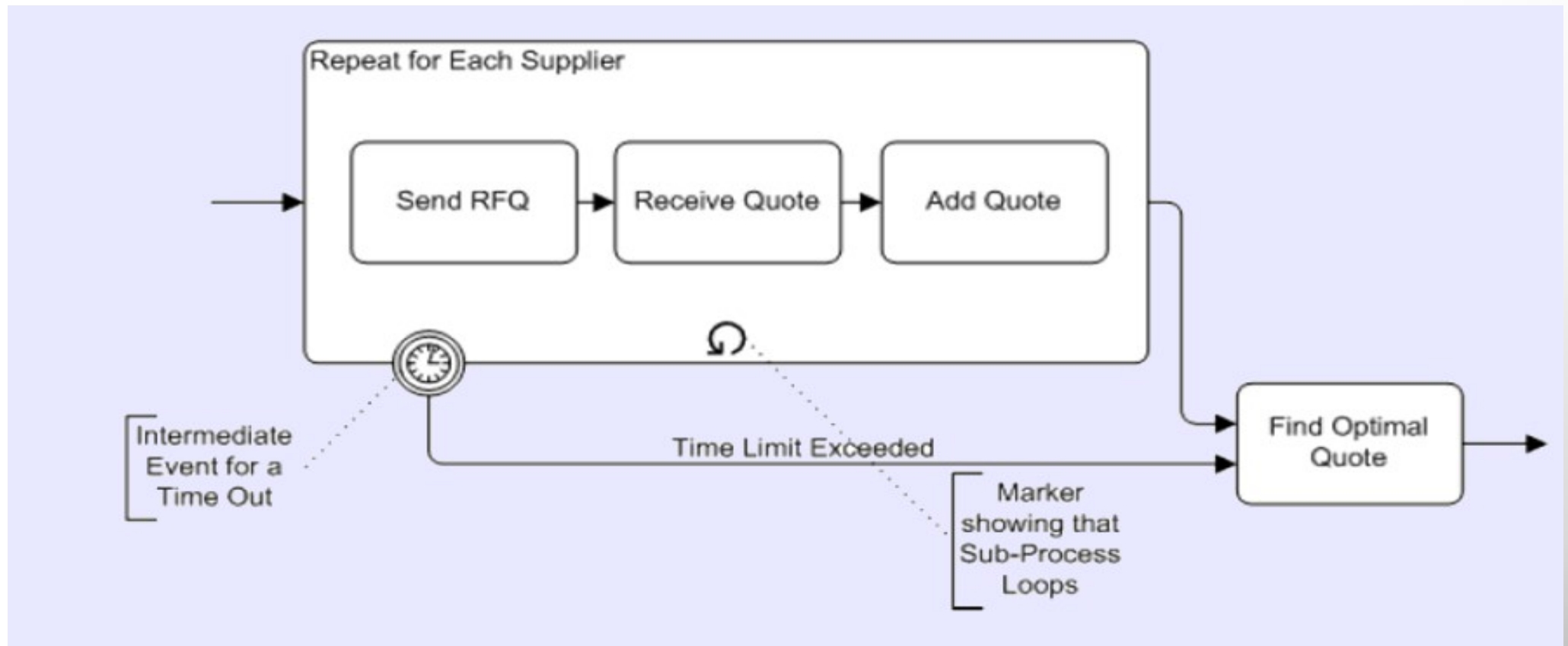
The sequence flow that enters and exits the expanded subprocess in the diagram is normal flow, and all possible paths within the subprocess are considered to be ad hoc flow.

The worker can choose to perform the tasks within the subprocess at any time, in any order, and repeating any number of times.



BPMN - Examples

Example: Concepts of Timer & Sub-Process loop



The complete syntax of BPMN

Gateway	A Gateway is used to control the divergence and convergence of multiple Sequence Flow. Thus, it will determine branching, forking, merging, and joining of paths.	
Gateway Control Types	Icons within the diamond shape will indicate the type of flow control behavior. The types of control include: • XOR -- exclusive decision and merging. Both Data-Based and Event-Based. Data-Based can be shown with or without the "X" marker. • OR -- inclusive decision and merging • Complex -- complex conditions and situations (e.g., 3 out of 5) • AND -- forking and joining Each type of control affects both the incoming and outgoing Flow.	Exclusive (XOR) Data-Based  or  Event-Based  Inclusive (OR)  Complex  Parallel (AND) 

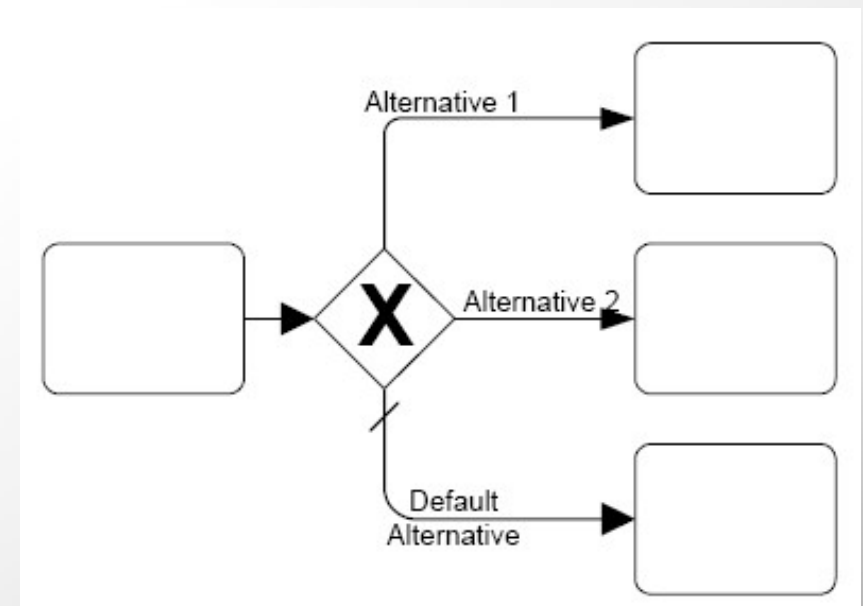
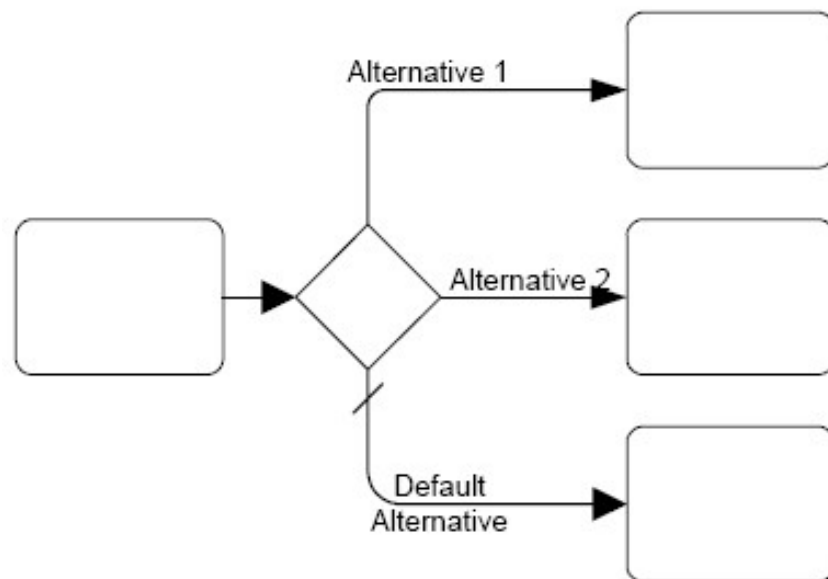
The complete syntax of BPMN

Exclusive XOR Data-based decision

Exclusive Gateways (Decisions) are locations within a business process where the Sequence Flow can take two or more alternative paths based on the conditional expression.

Exclusive decision can be shown with or without the 'X' marker.

"Only 1"



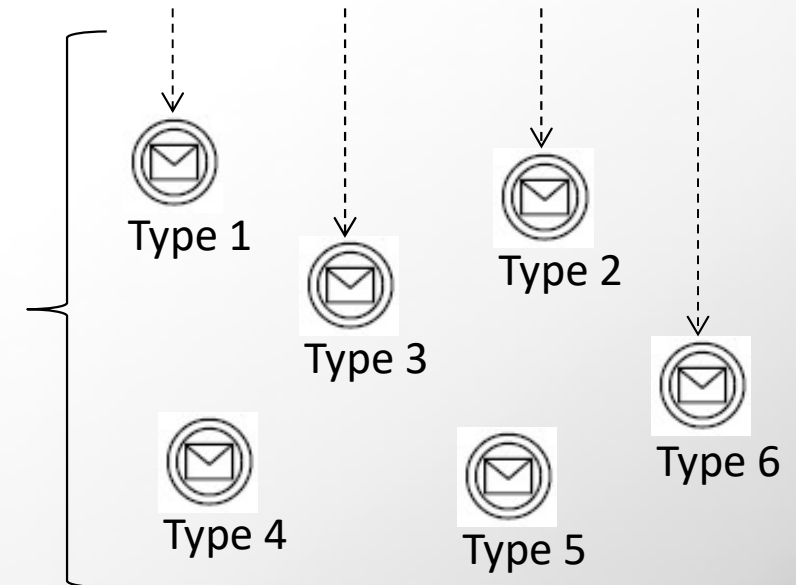
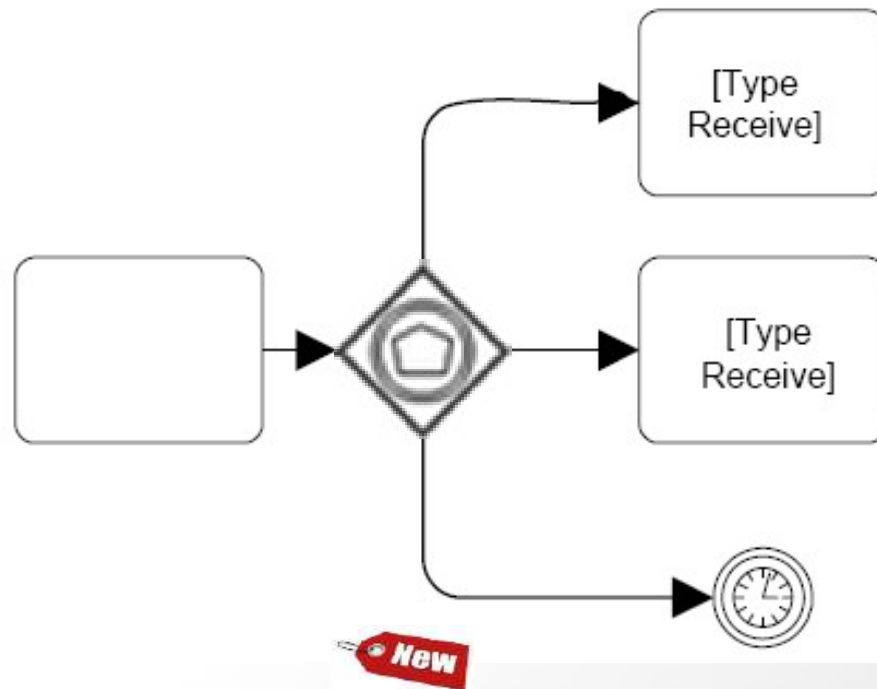
The complete syntax of BPMN

Exclusive XOR Event-based decision

The inclusion of Event-Based Exclusive Gateways is the result of recent developments in the handling of distributed systems.

A specific event, usually the receipt of a message, determines which of the paths will be taken.

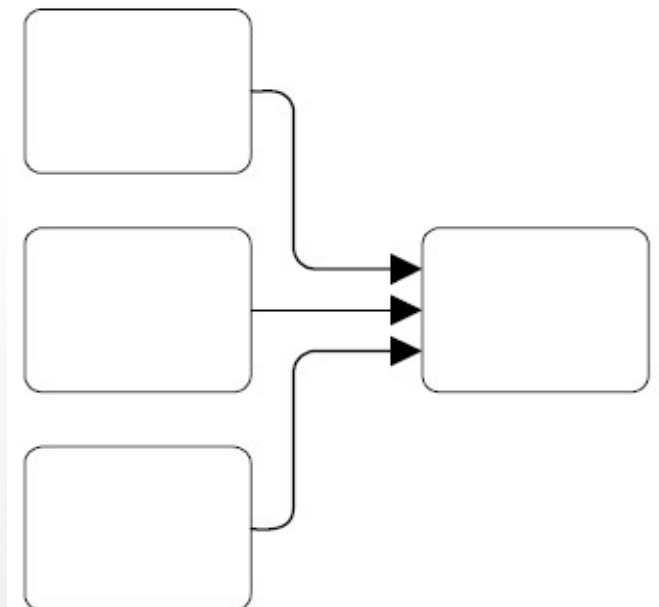
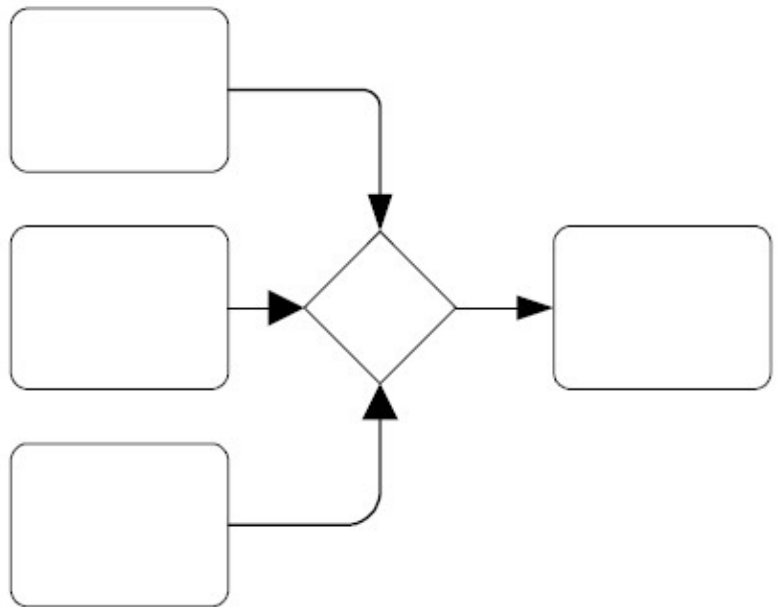
“Only 1”



The complete syntax of BPMN

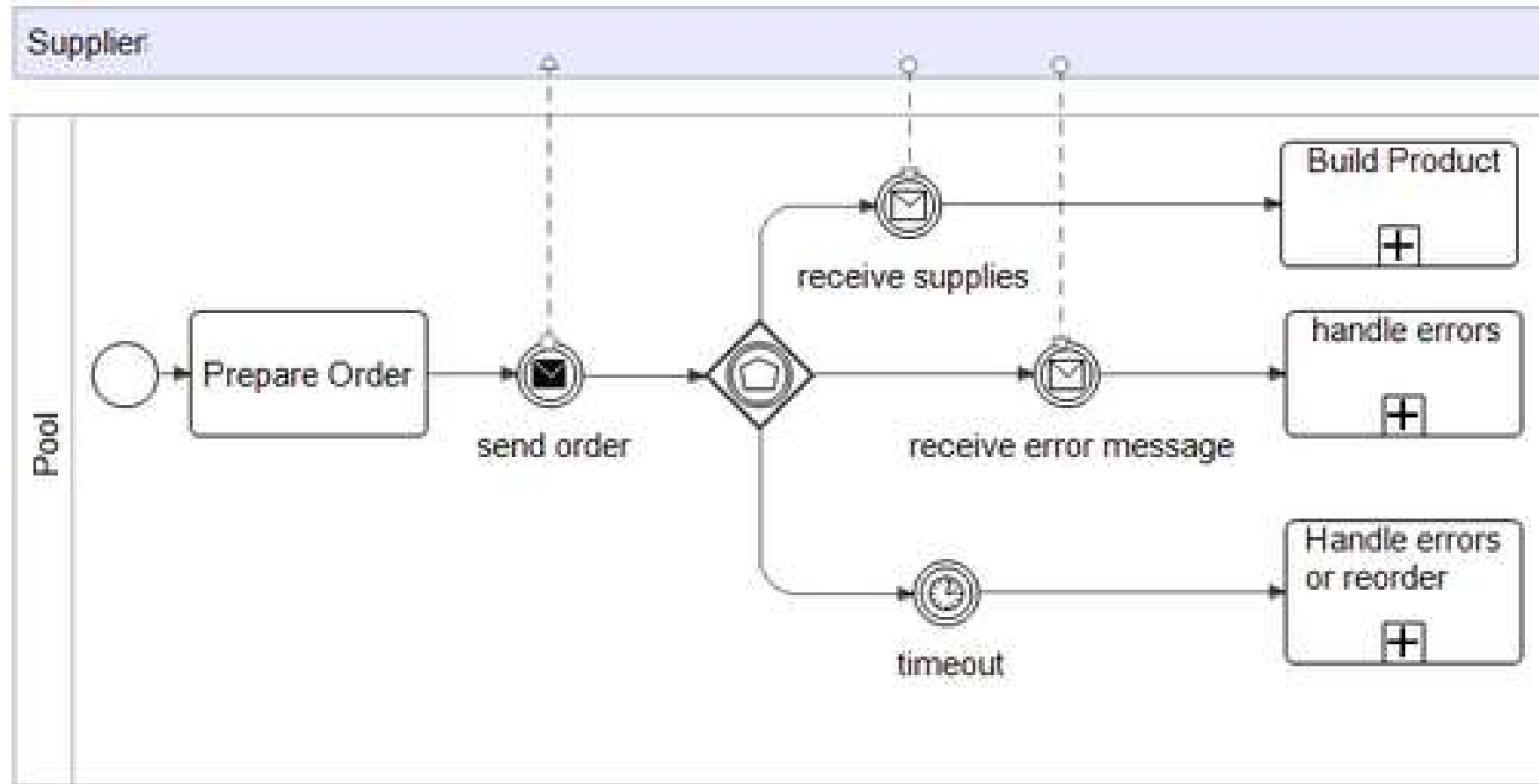
Exclusive XOR Merge

Exclusive merge can be shown with or without the 'X' marker.



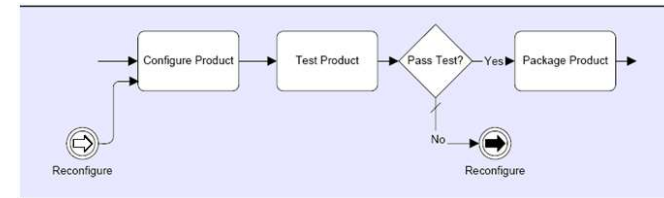
BPMN - Examples

Example: Exclusive XOR Event-based gateway



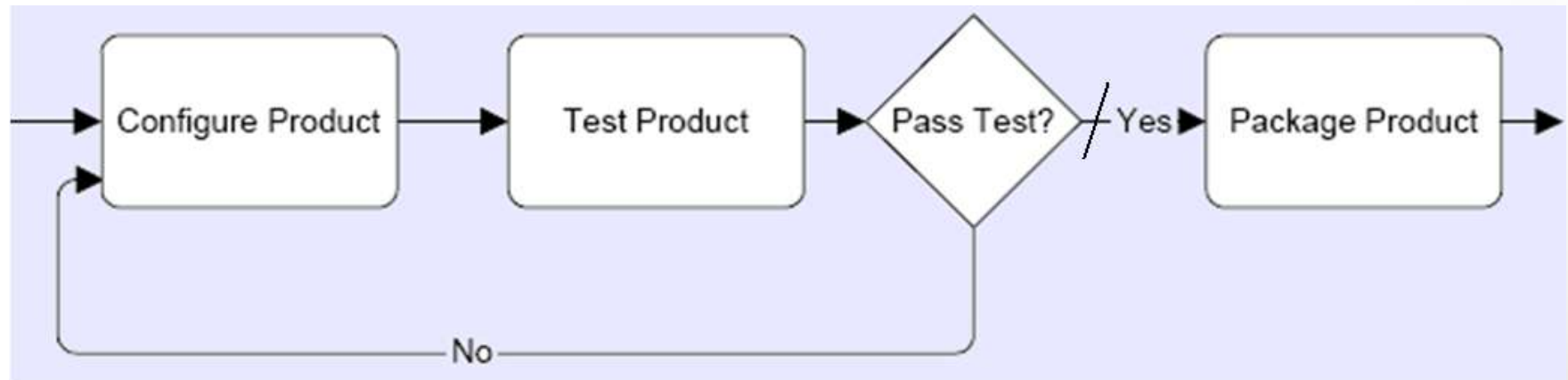
BPMN - Examples

Example: Loops with gateways

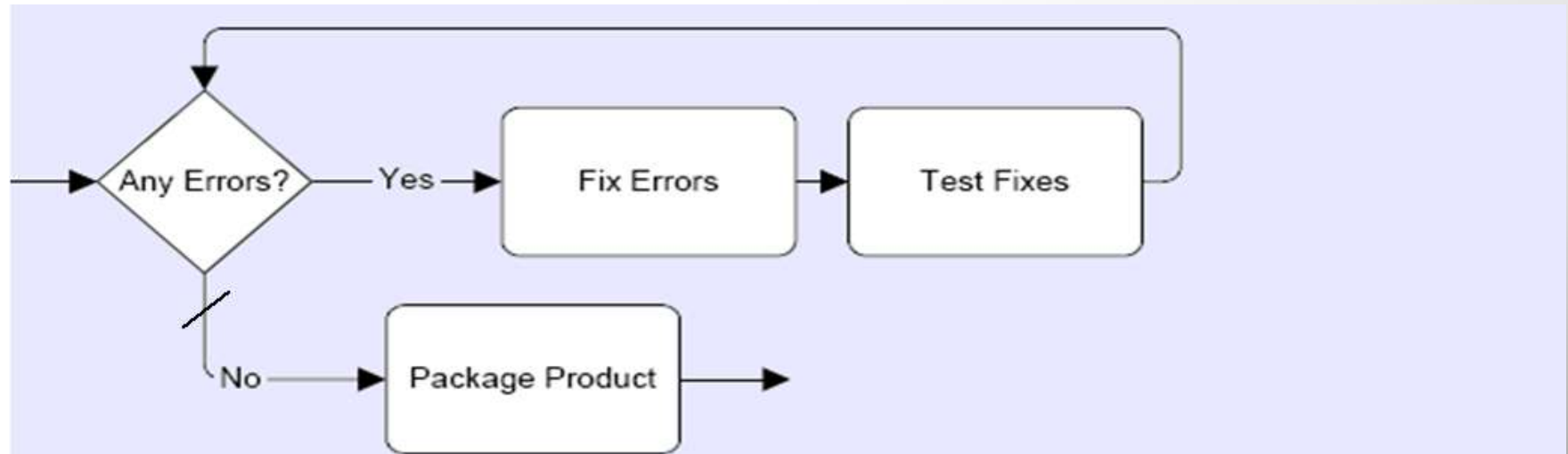


Alternative

An until loop



An while loop

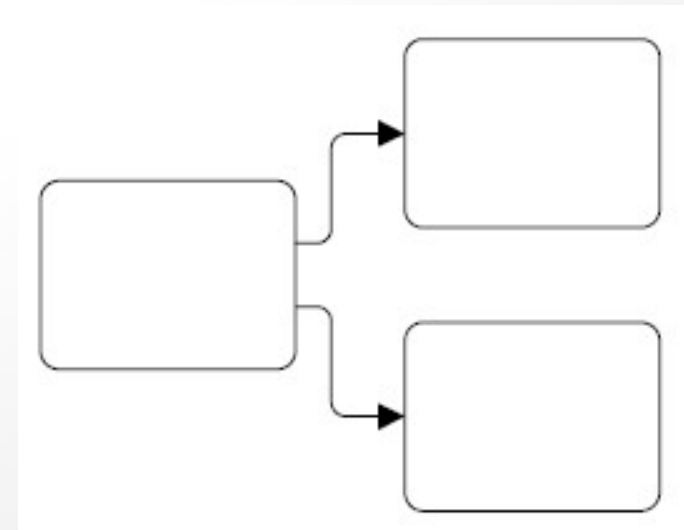
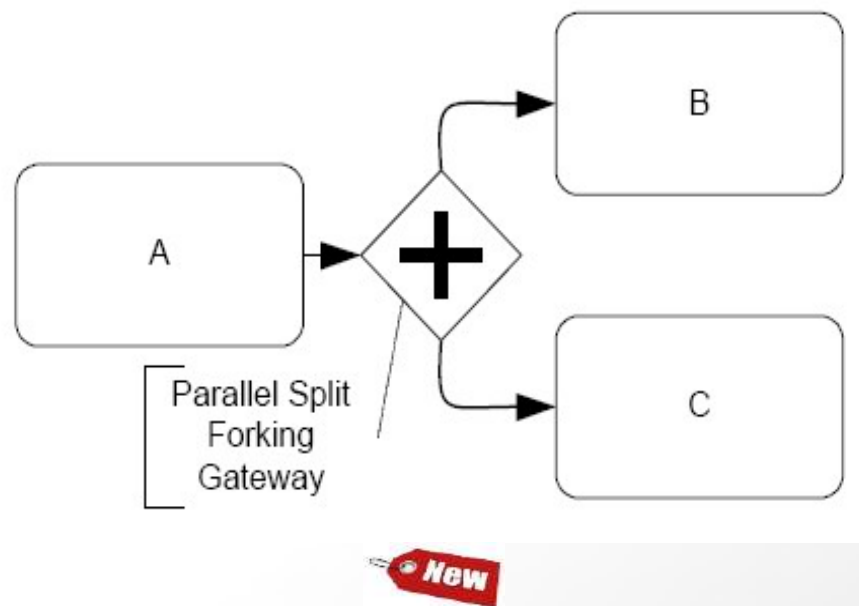


The complete syntax of BPMN

Parallel AND forking

Parallel Gateways provide a mechanism to synchronize parallel flow and to create parallel flow. These Gateways are not required to create parallel flow, but they can be used to clarify the behavior of complex situations where a string of Gateways are used and parallel flow is required.

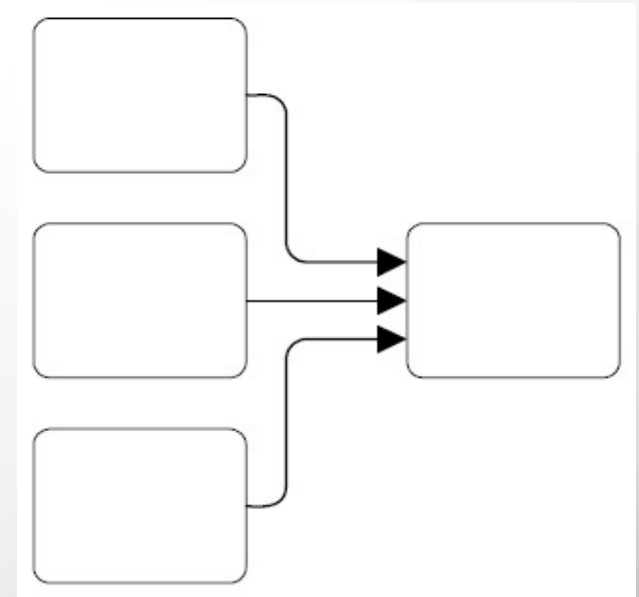
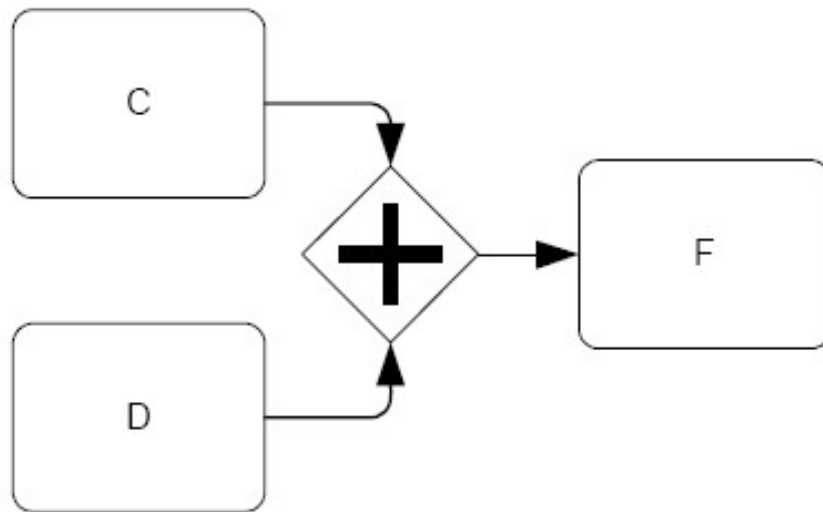
“All”



The complete syntax of BPMN

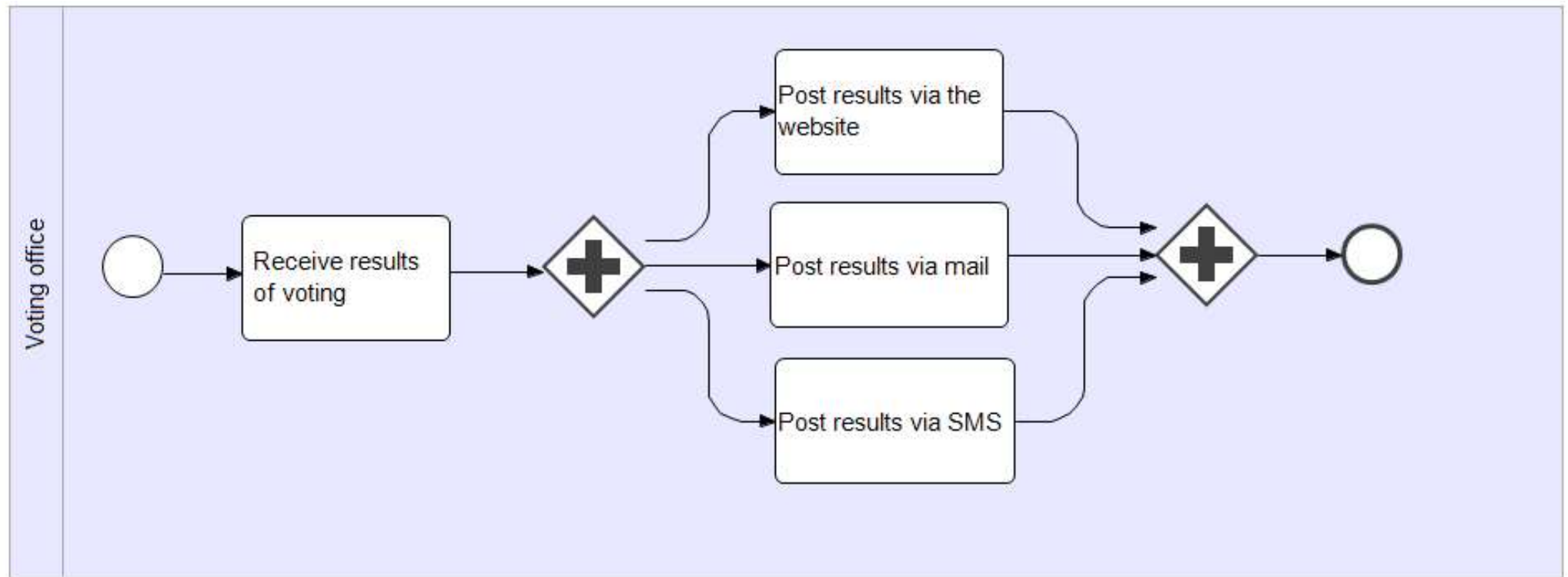
Parallel AND joining

The AND gate must receive a signal from all input Sequence Flows for the output flow to be taken. The process flows wait for all signals to arrive at the AND gateway before it can continue.



BPMN - Examples

Example: Parallel AND forking

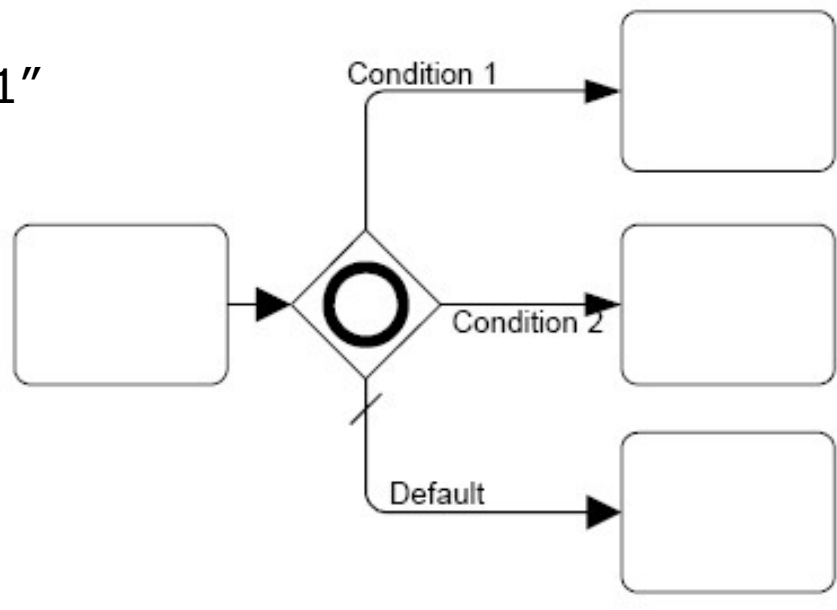


The complete syntax of BPMN

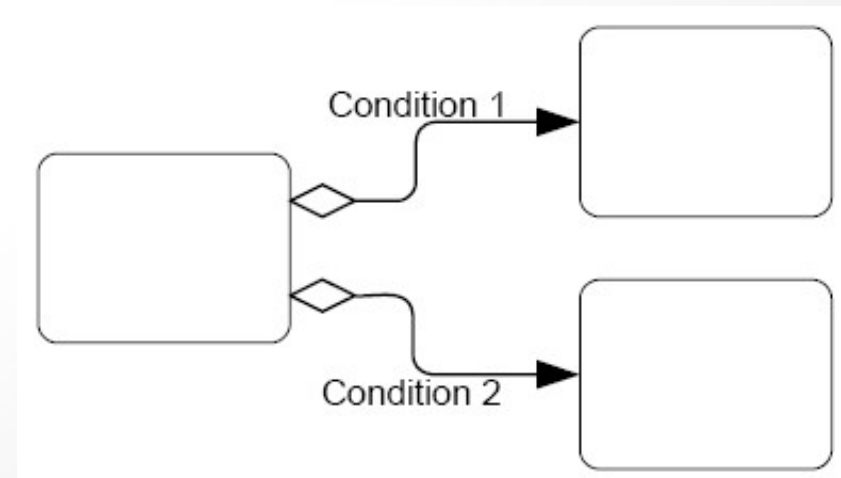
Inclusive OR decision

Inclusive (think ‘including’) means one or more of the outgoing Sequence Flows from the decision may be taken. There can not be zero output flows – you must specify a default flow.

“At least 1”



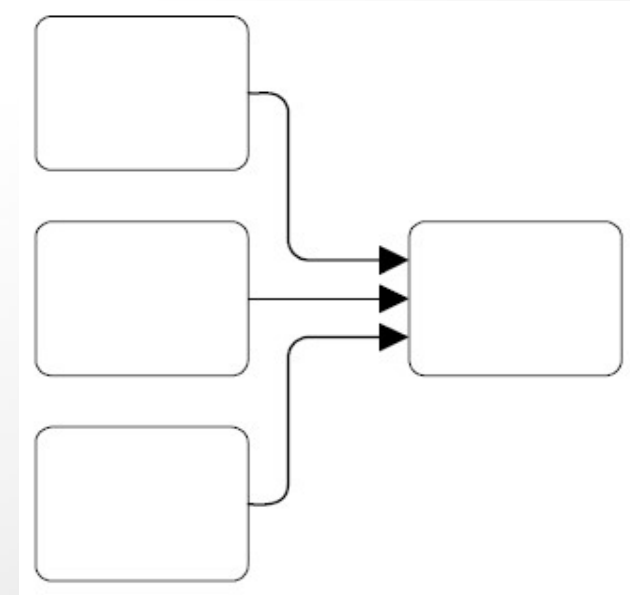
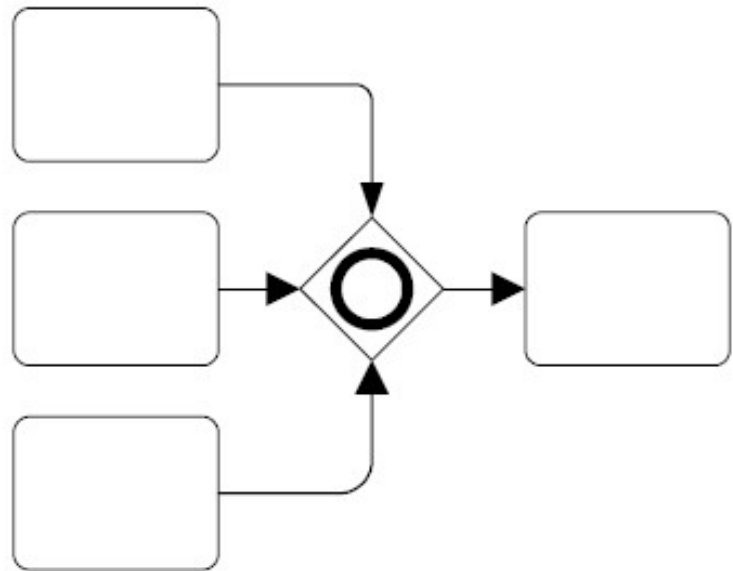
Alternative - Conditional flow



The complete syntax of BPMN

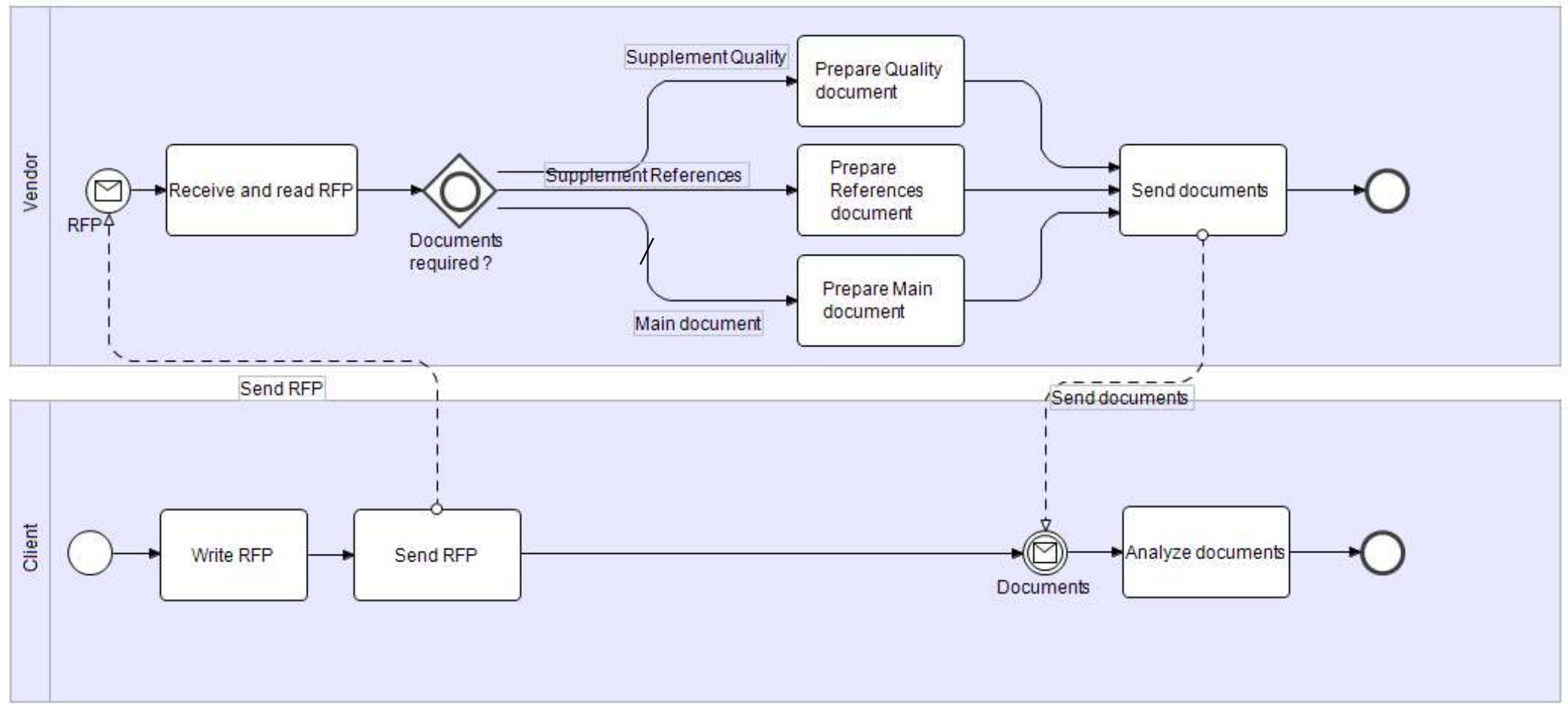
Inclusive OR Merge

Inclusive (think 'including') means that the process flow continues when all input signal arrives from any of the set of input Sequence Flows. So an Inclusive OR Merge acts like an AND Merge.



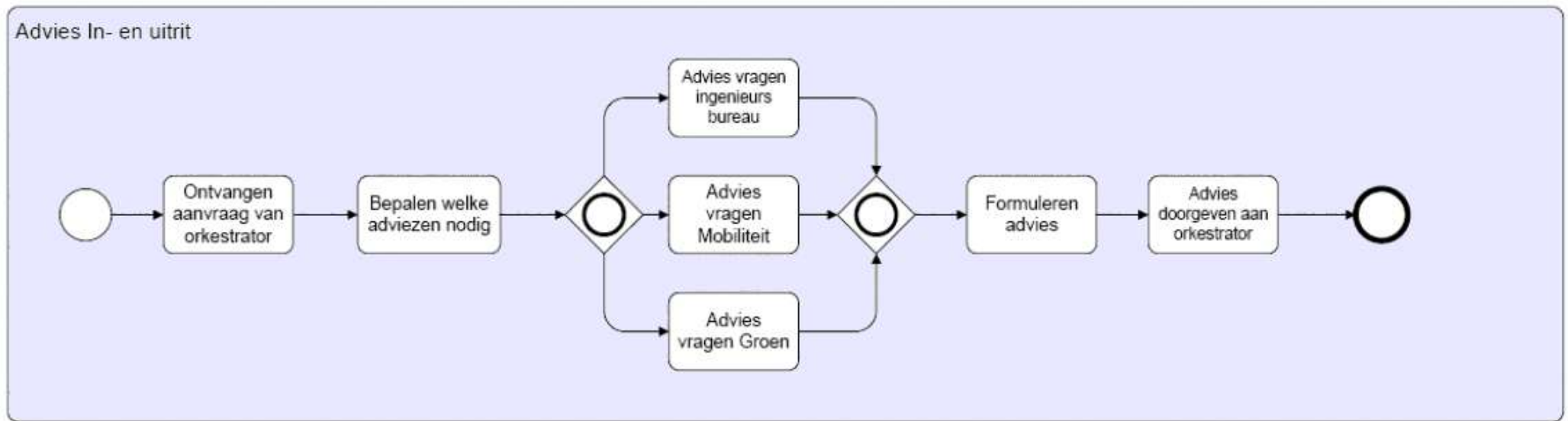
BPMN - Examples

Example: Inclusive OR decision



BPMN - Examples

Example: Inclusive OR decision

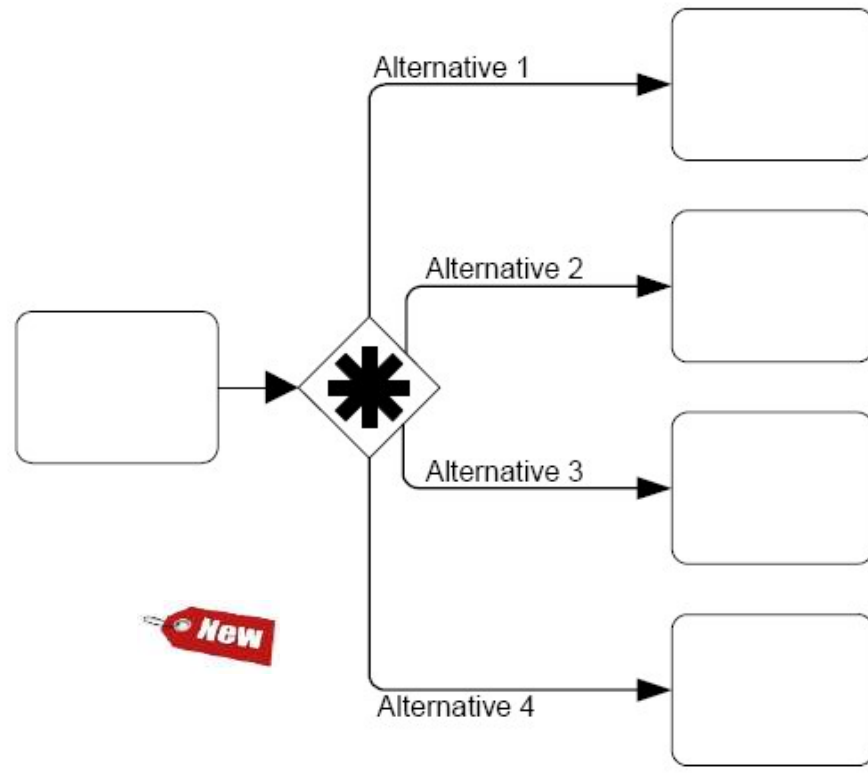


The complete syntax of BPMN

Complex decision

You specify a complex flow condition that references outgoing Sequence Flow names. The expression determines which output flow is taken. For example, an expression may evaluate Process data and then select different sets of outgoing Sequence Flow, based on the results of the evaluation. However, The expression should be designed so that at least one of the outgoing Sequence Flow will be chosen.

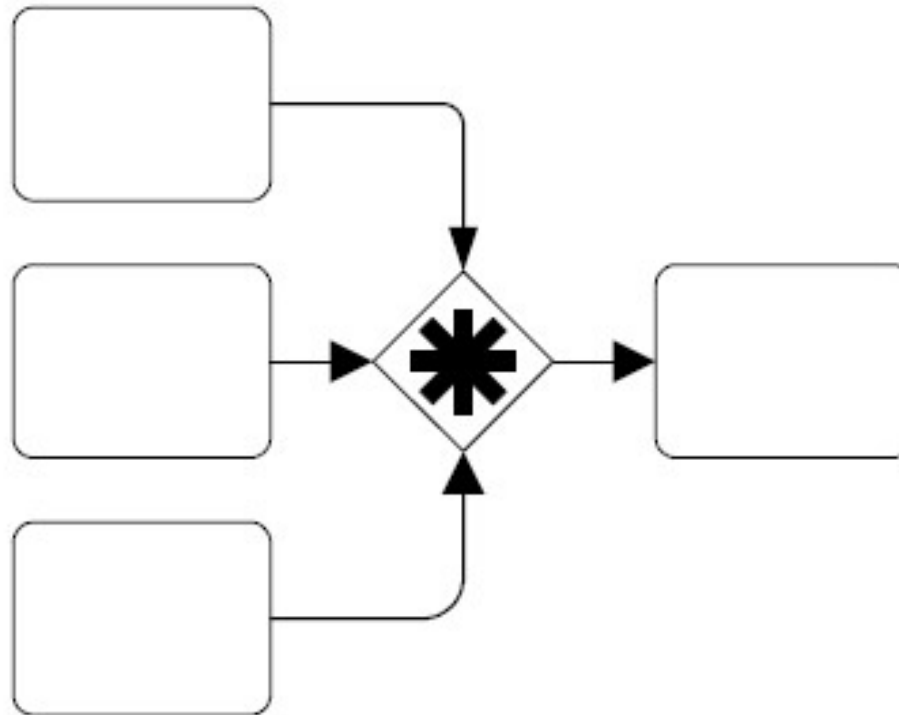
“At least 1”



The complete syntax of BPMN

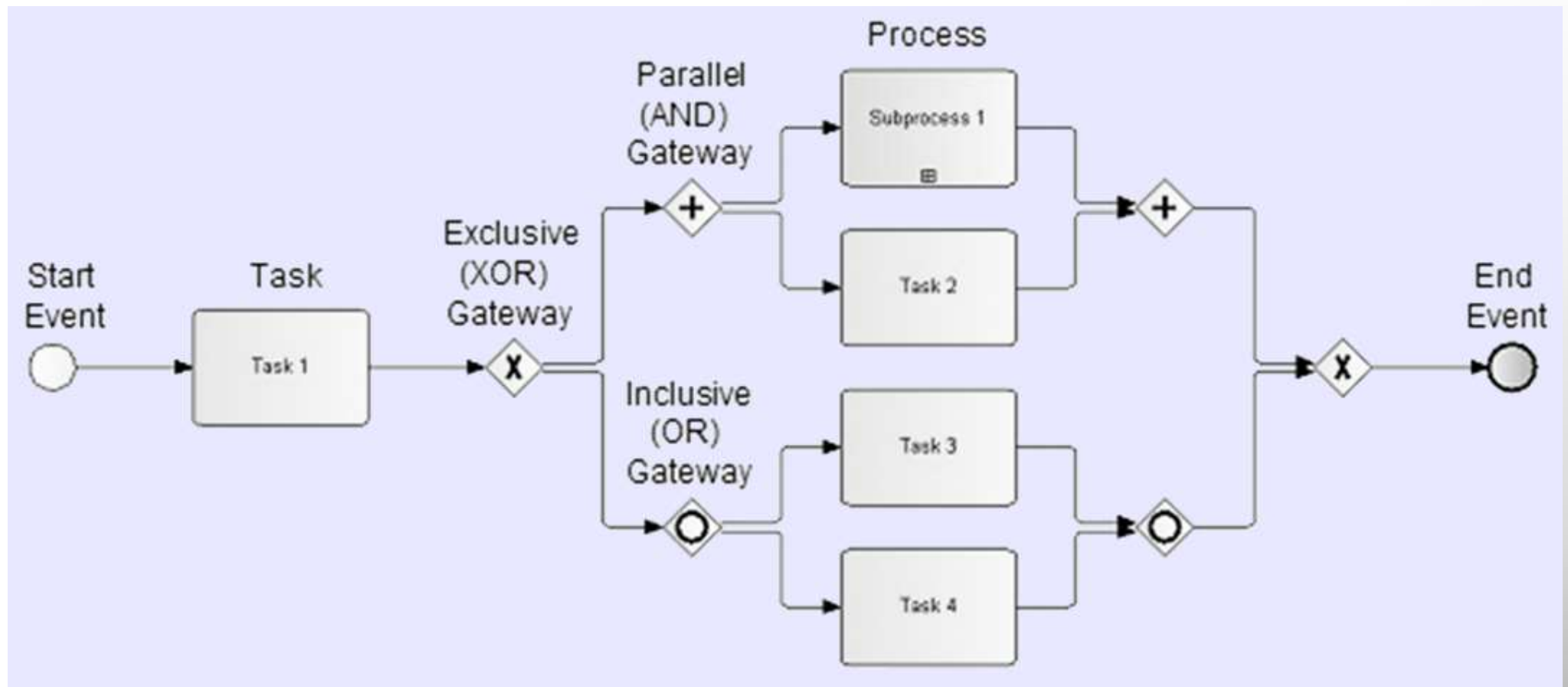
Complex merge

When the Gateway is used as a Merge, then there will be an expression that will determine which of the incoming Sequence Flow will be required for the Process to continue. The expression may refer to process data and the status of the incoming Sequence Flow. For example, an expression may specify that any 3 out of 5 incoming Tokens will continue the Process.



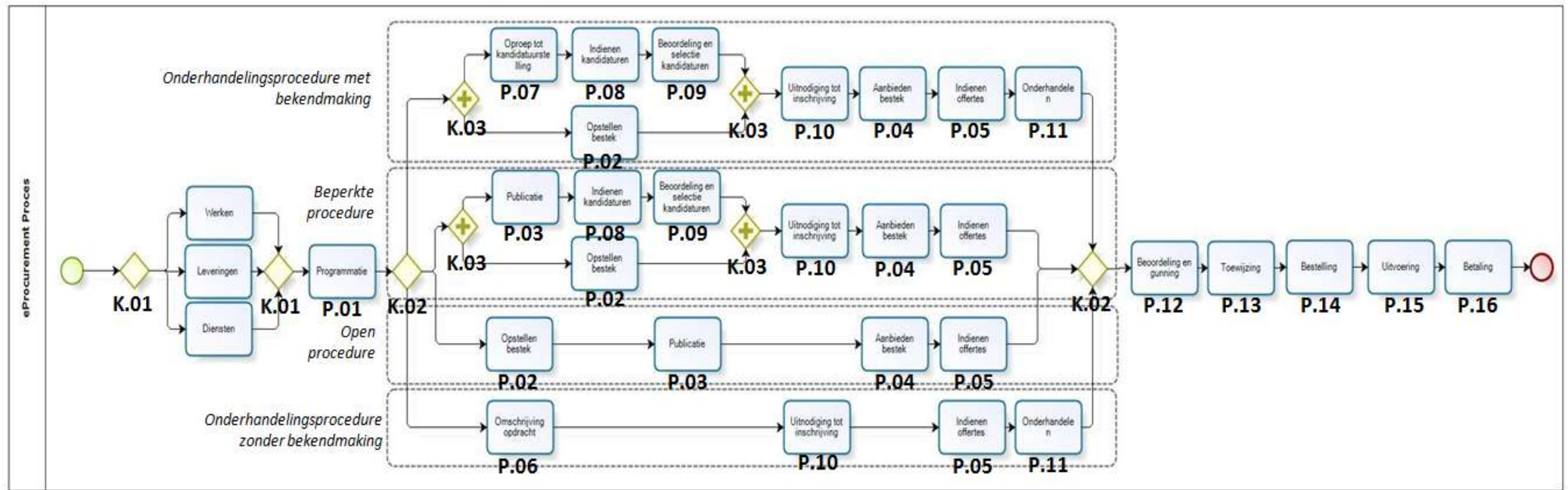
BPMN - Examples

Example: Concepts of forking (AND), joining (AND), exclusive (XOR), merging (XOR), inclusive OR and merge OR



BPMN - Examples

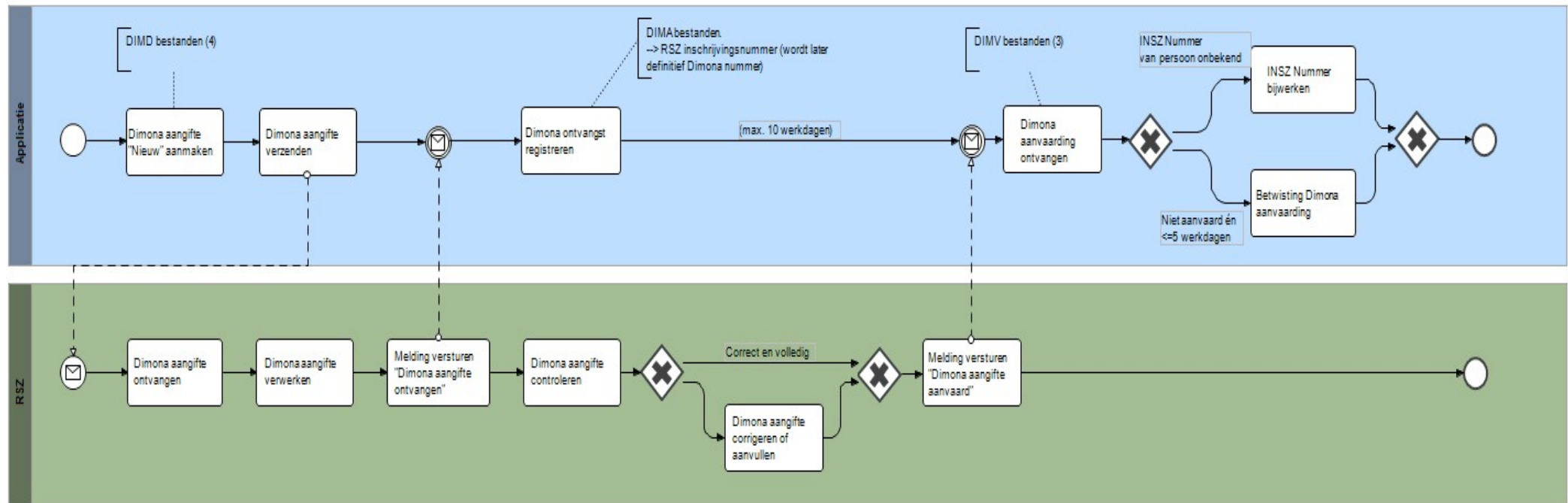
Example: 'eProcurement Process'



BPMN - Examples



Example: 'Dimona aangifte'

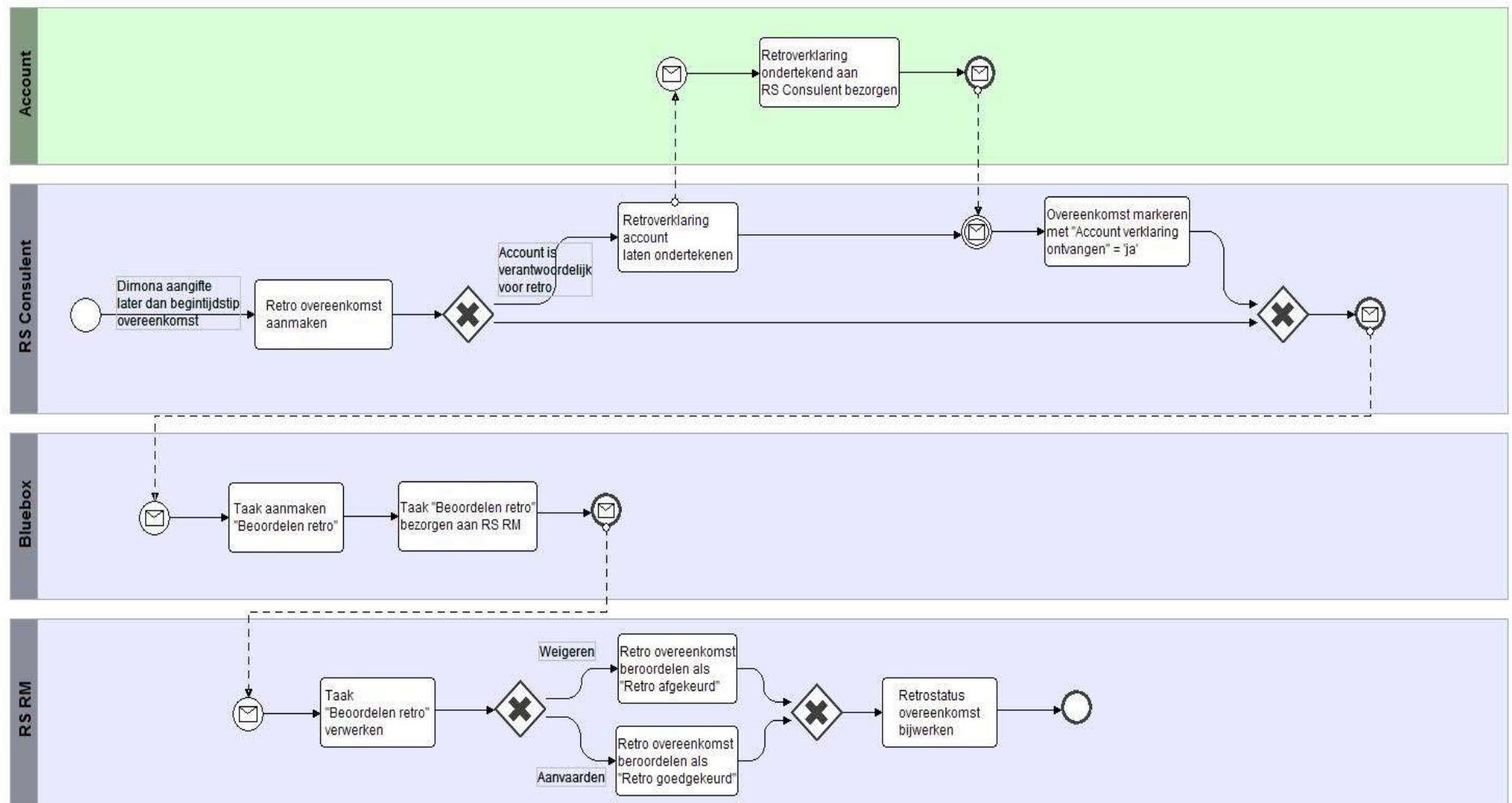


BPMN - Examples



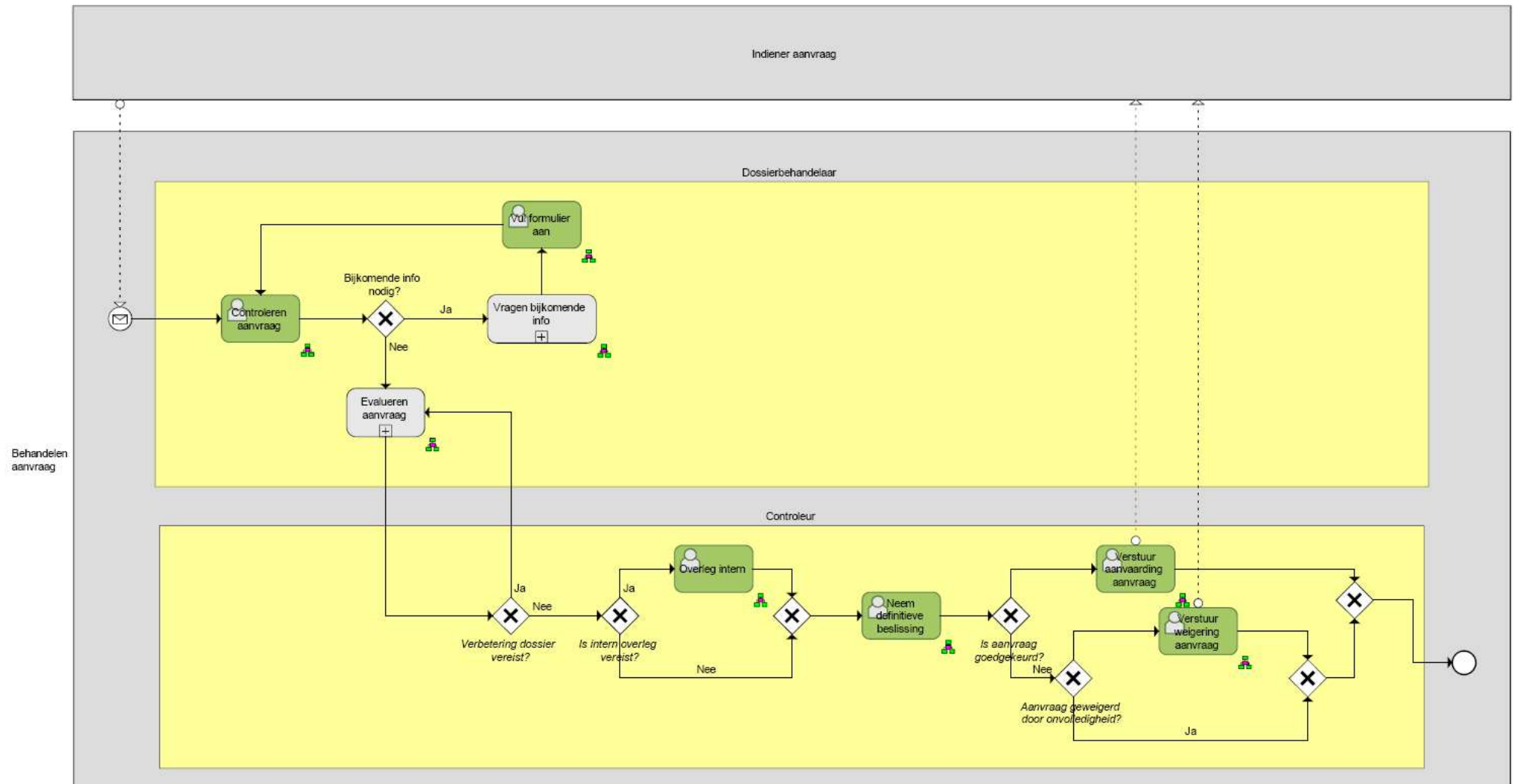
Example: 'Dimona aangifte'

Retro overeenkomsten: nieuw BP



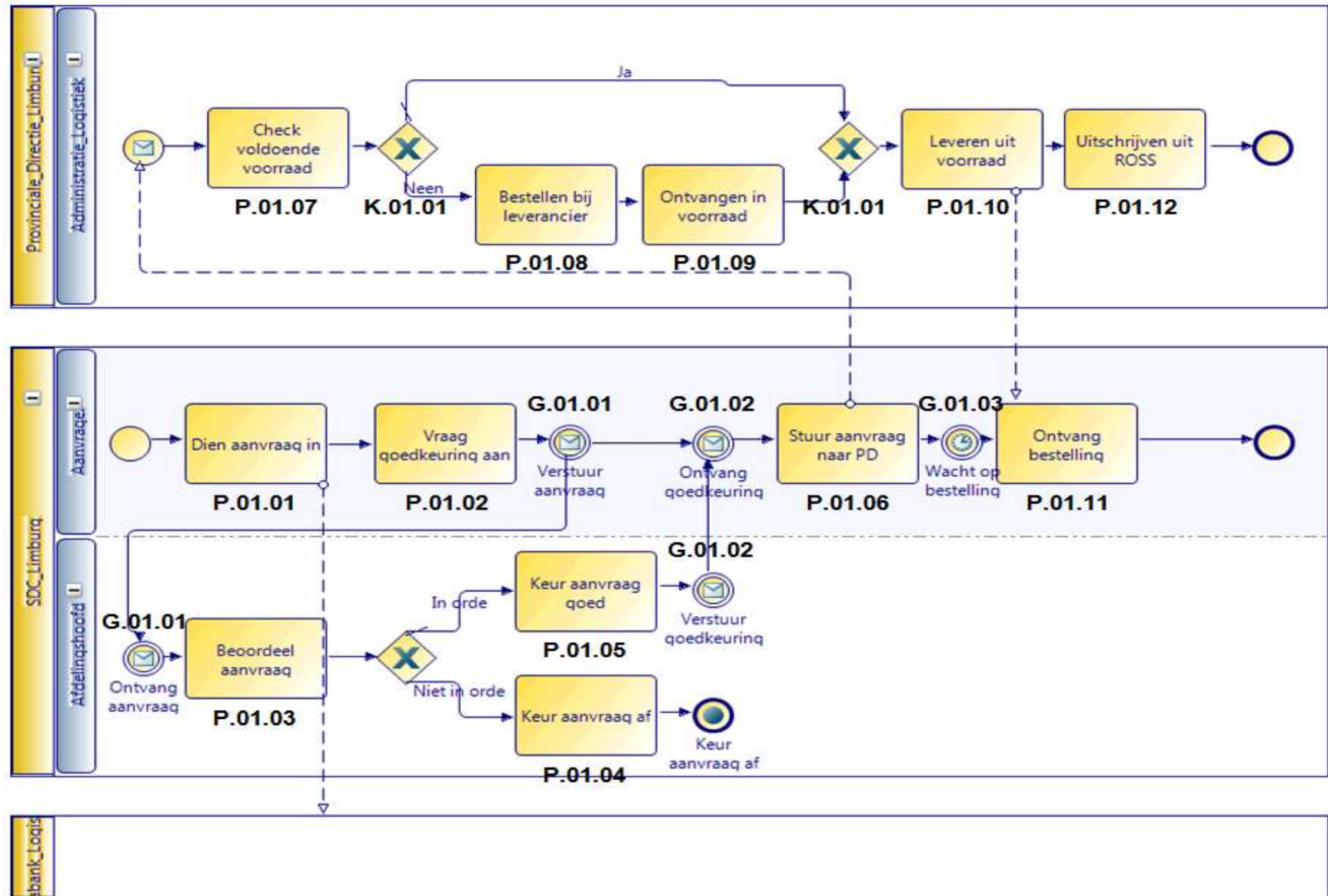
BPMN - Examples

Example: 'Behandelen aanvraag'

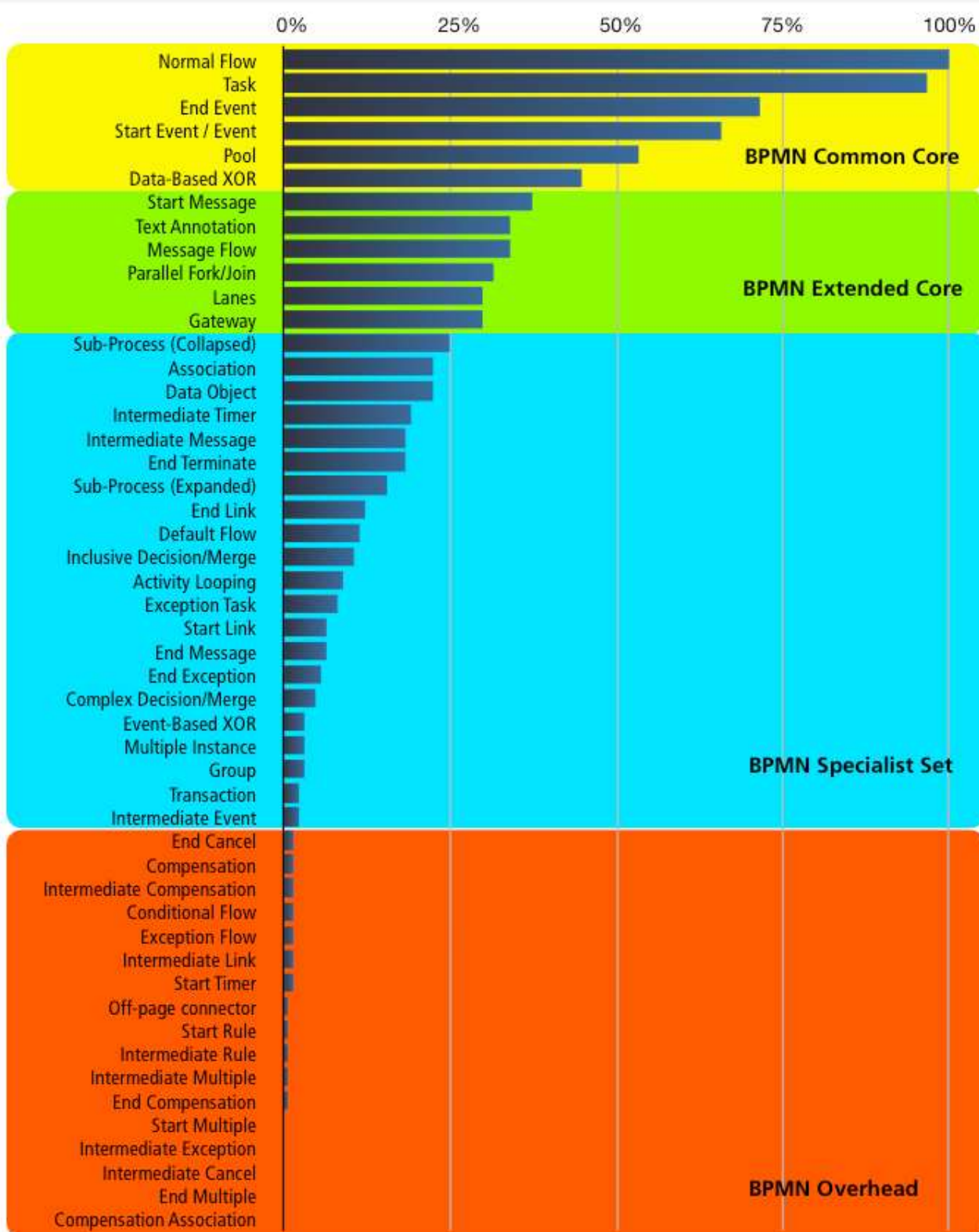


BPMN - Examples

Example: 'Logistiek proces - aanvraag kleding'



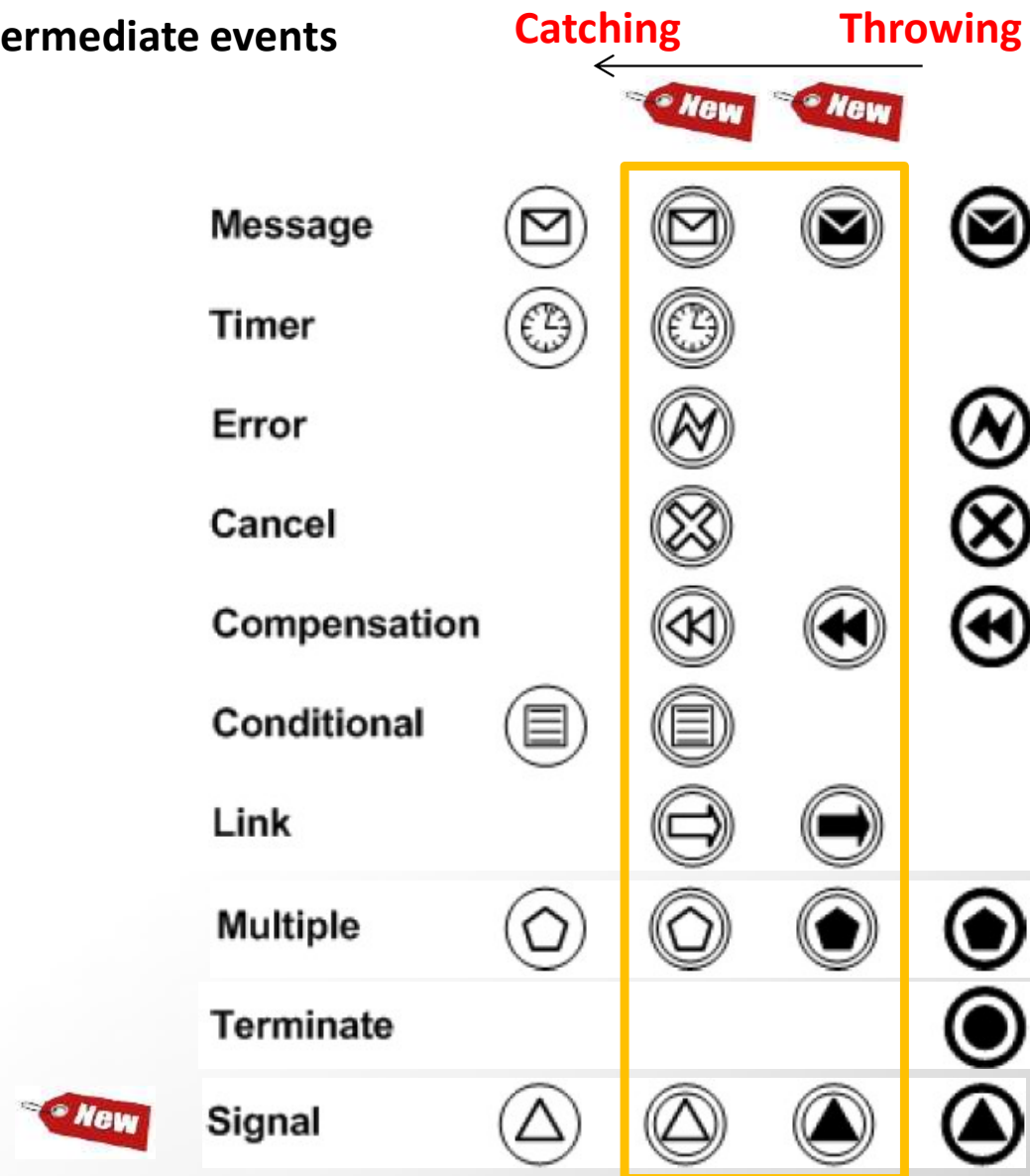
The syntax of BPMN – Use of BPMN symbols



The complete syntax of BPMN

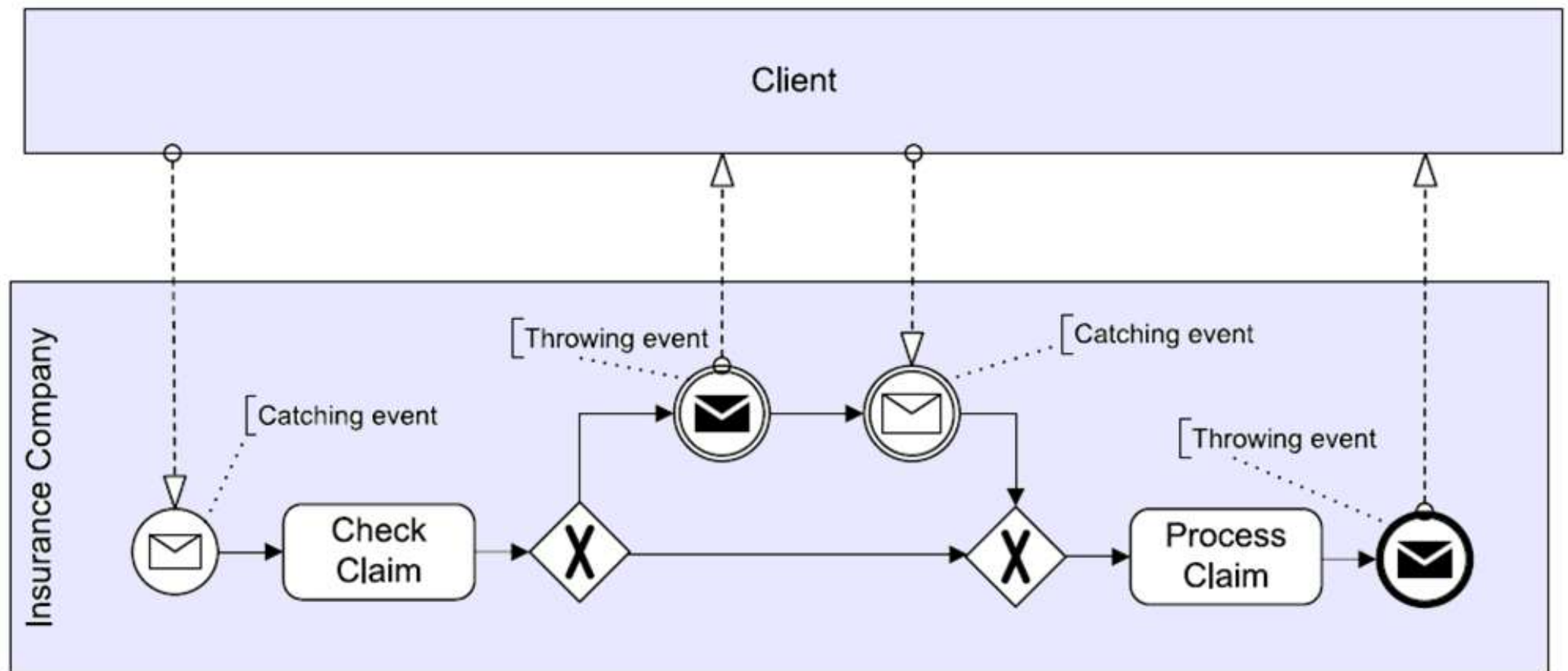
More details in intermediate events

Events:



BPMN - Examples

Example: Throwing and Catching



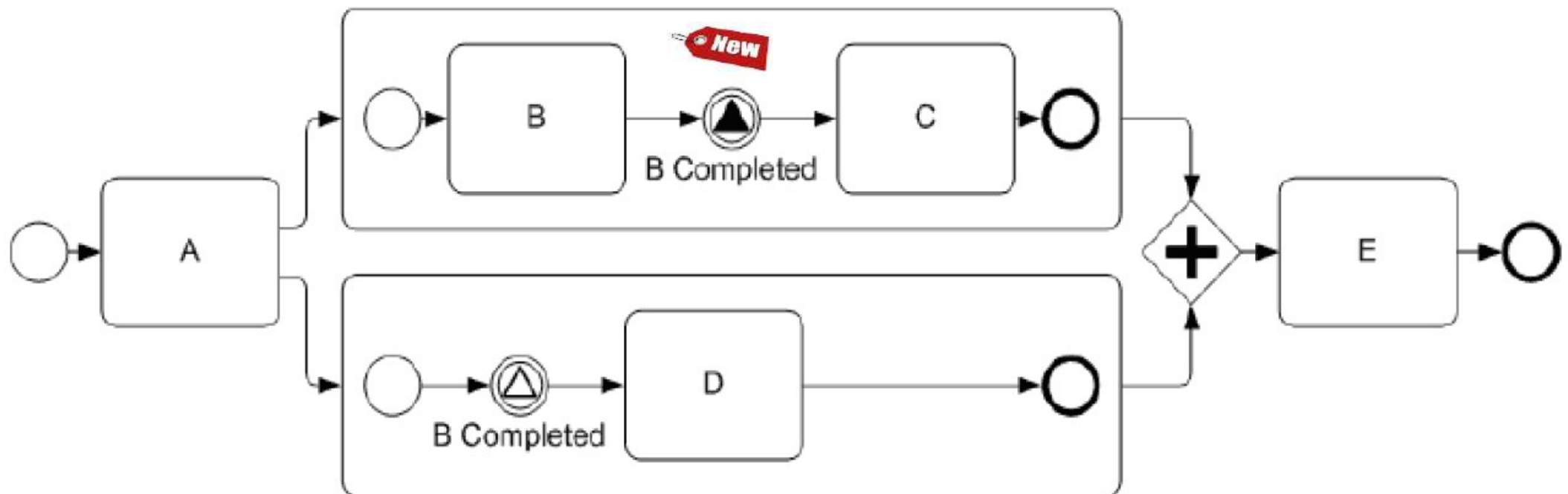
The complete syntax of BPMN

Signal event

A signal in BPMN is to be seen as a signal flare **broadcasting the occurrence of an event**. Anyone seeing this flare is now aware of the signal and can react on it.

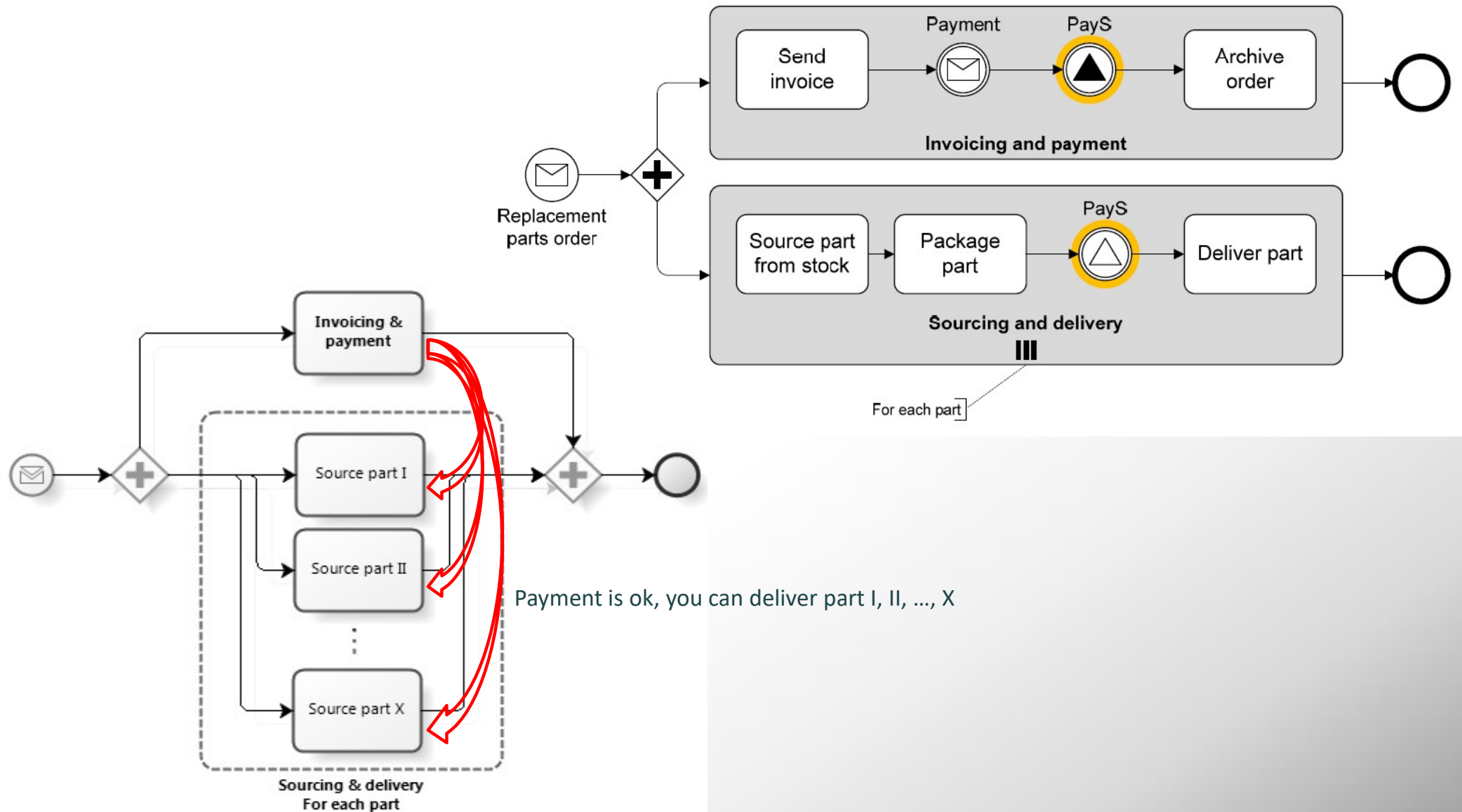
The workflow milestone pattern:

In this example two sub-processes need to synchronize , this was not possible in BPMN 1.0 .



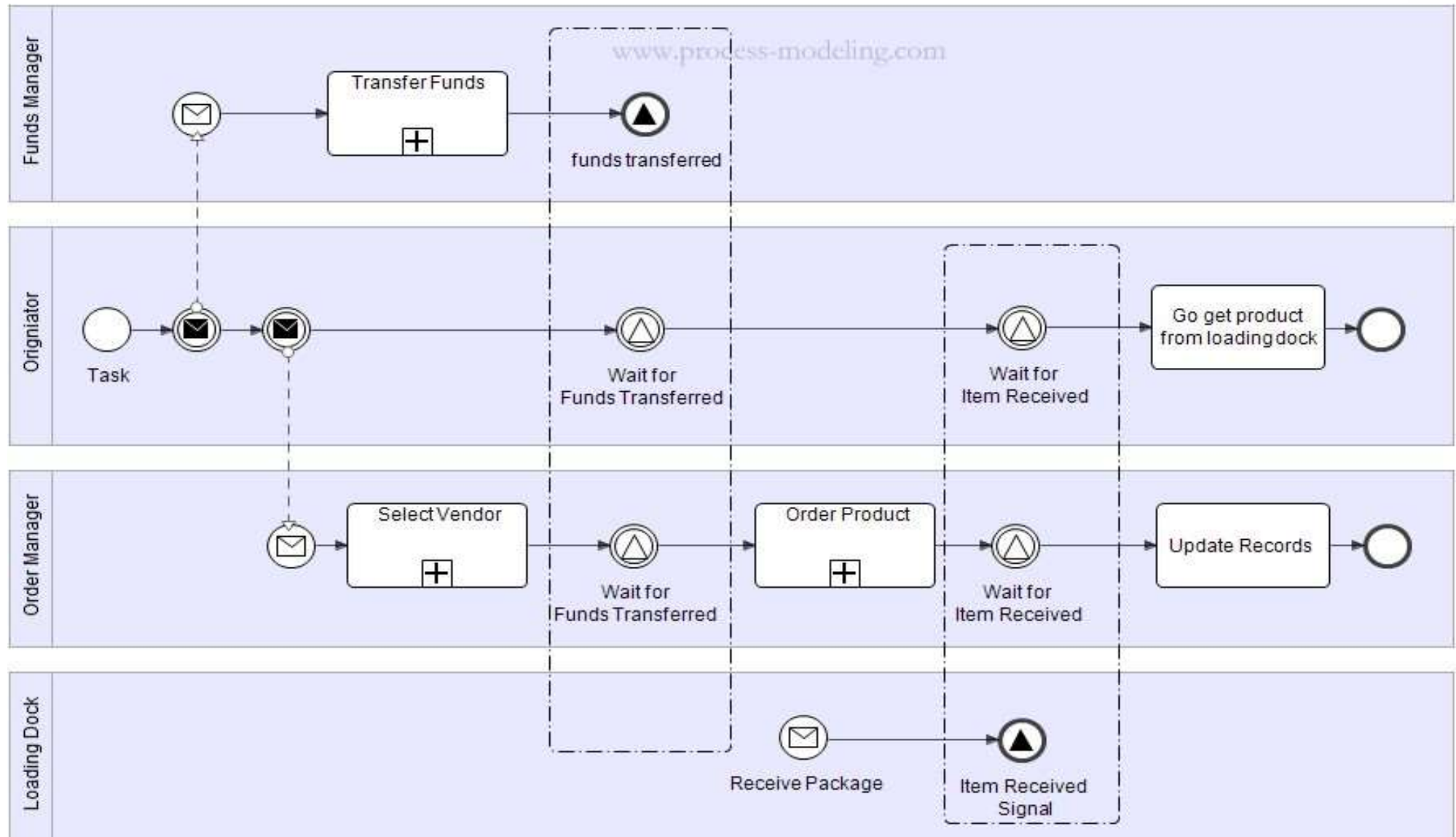
BPMN - Examples

Example: ' Payment & Delivery synchronisation ' - Workflow milestone pattern



BPMN - Examples

Example: 'Synchronization accross' multiple participants



The complete syntax of BPMN

BPMN Task elements:

Graphical markers for individual Task types :

Task (Atomic)	A Task is an atomic Activity that is included within a Process A Task is used when the work in the Process is not broken down to a finer level of Process detail.	
---------------	---	---

New



User Task means accessed or performed at a computer.

New



Manual Task means no computer involvement.

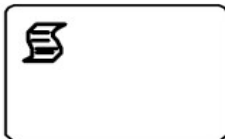
We try to ignore Manual Task ... always take User task for human tasks.

New



Service Task means automated function performed by process engine itself.

New



Script Task means automated function performed by anything other than the process.

New

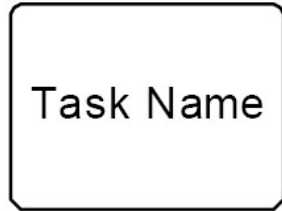


Business Rule Task is a special kind of Service task. Automated means zero human involvement and is triggered automatically by “the process”.

The complete syntax of BPMN

BPMN Task elements:

Graphical markers for individual Task types :

Task (Atomic)	A Task is an atomic Activity that is included within a Process A Task is used when the work in the Process is not broken down to a finer level of Process detail.	
---------------	---	---



Send Task means; sending the (automated, electronic) message is the only action performed



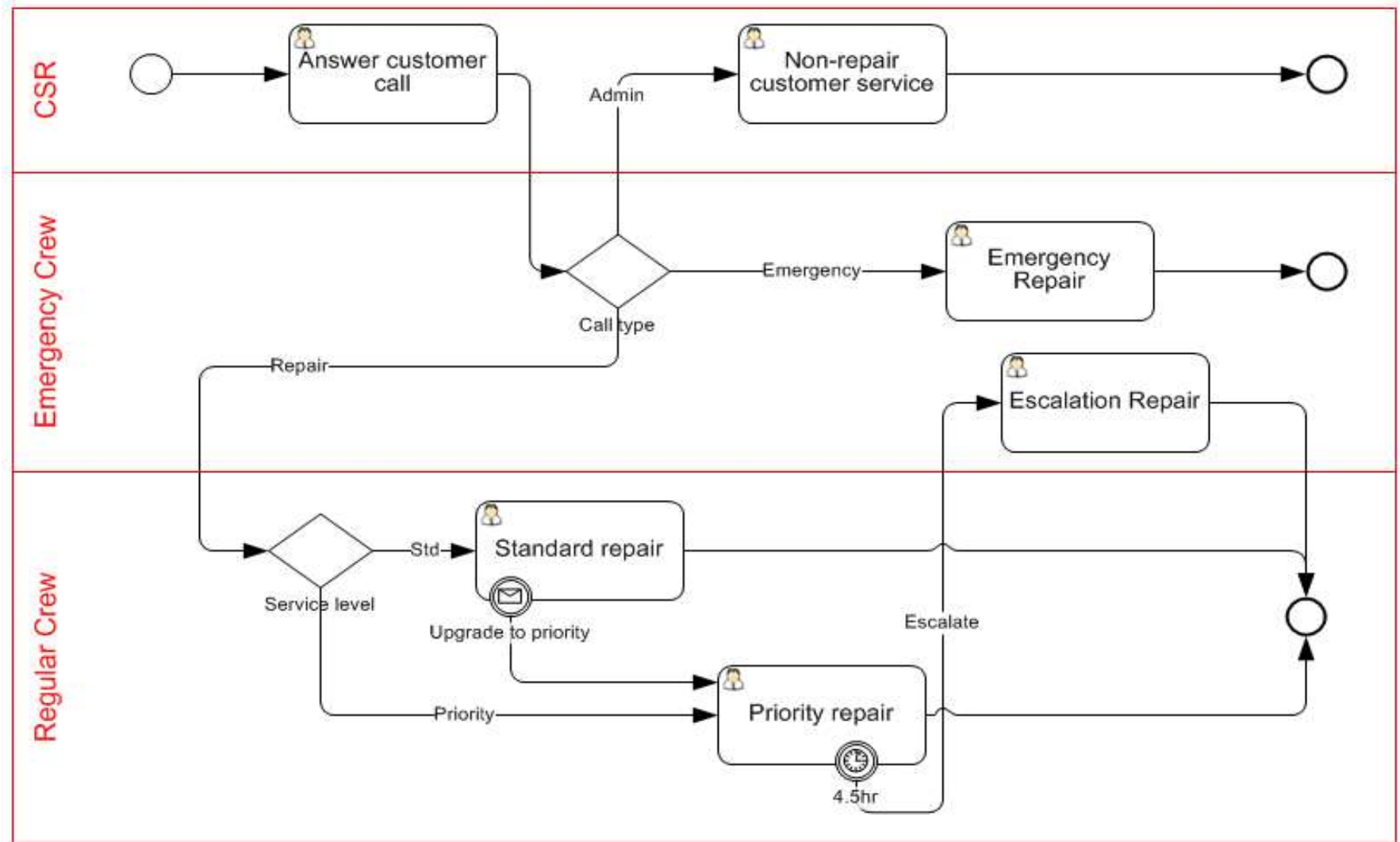
Receive Task means; receiving the (automated, electronic) message is the only action performed

Definition of a message: any signal between the process and external entity

- Electronic message, e.g. SOAP or JMS
- Email
- Fax or paper mail
- Phone call

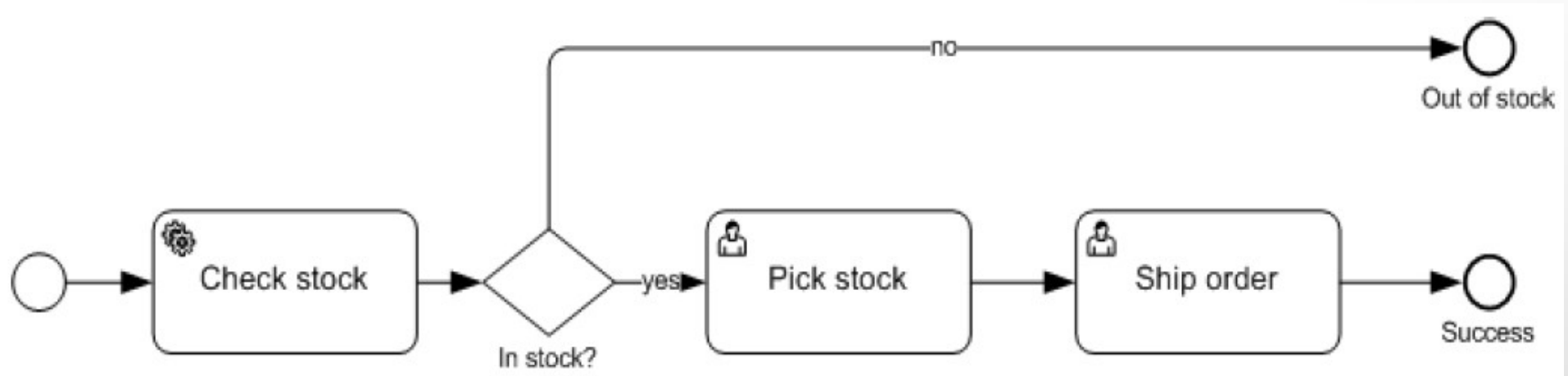
BPMN - Examples

Example: 'Repair Process (As-Is)'



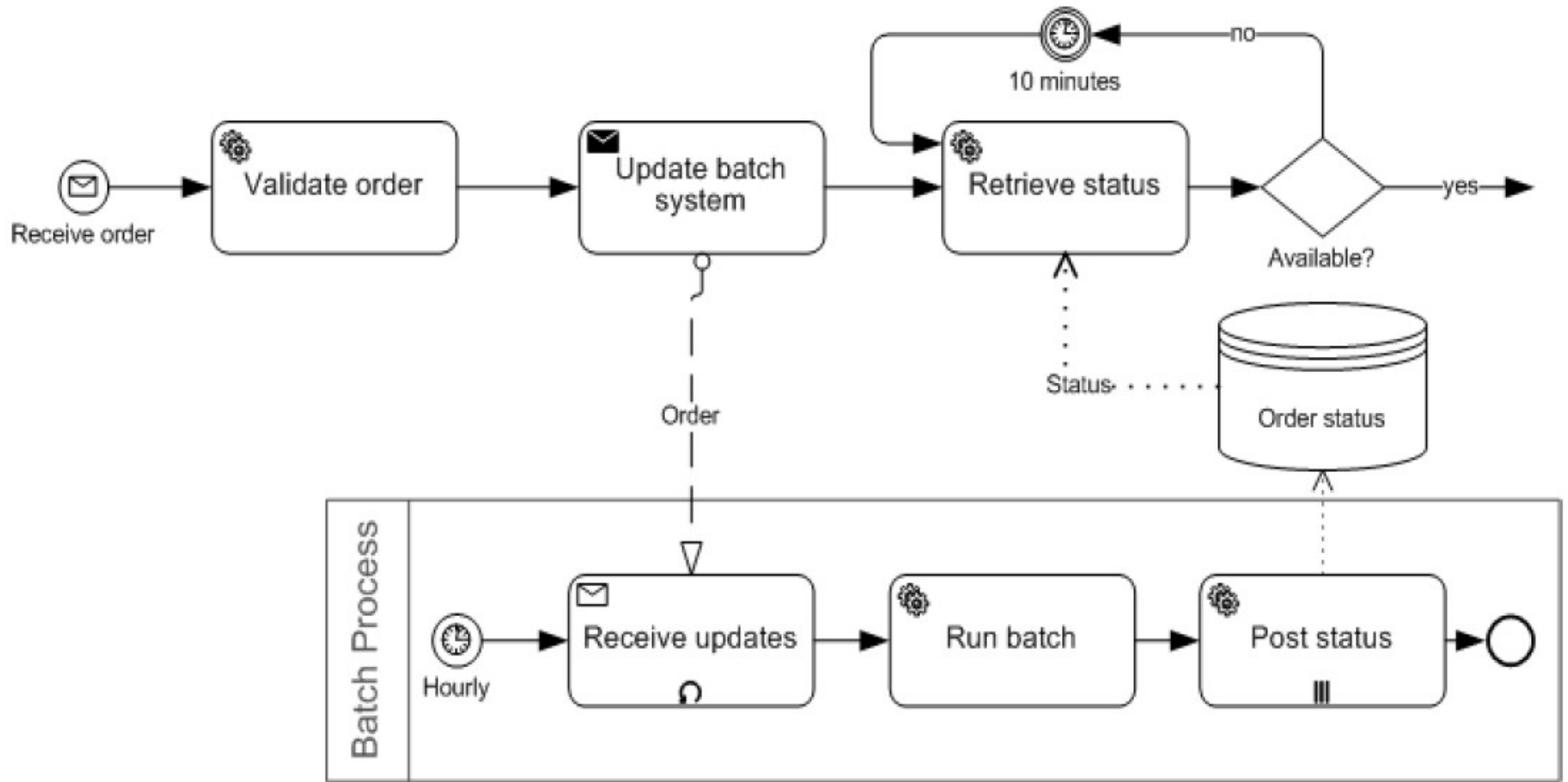
The complete syntax of BPMN

Examples: Graphical markers for individual Task types



The complete syntax of BPMN

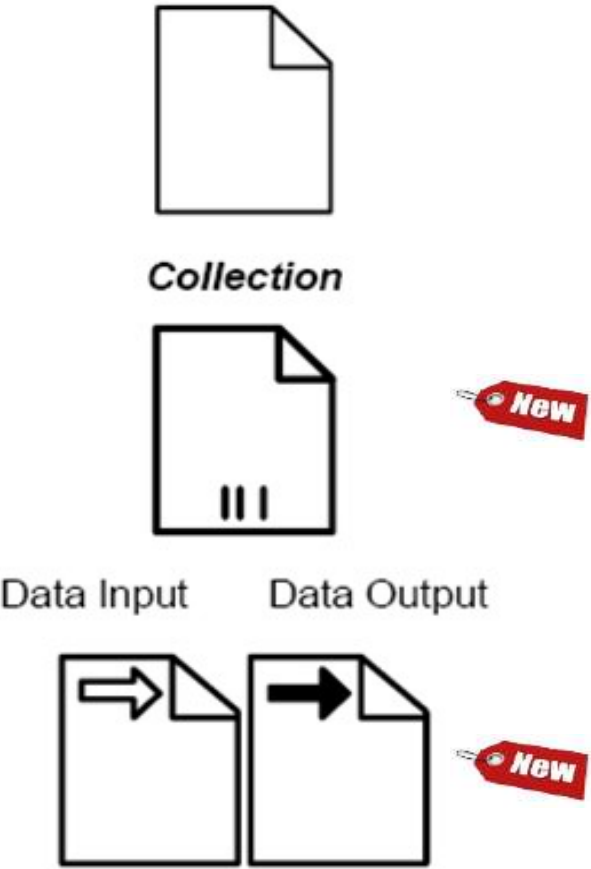
Examples: Graphical markers for individual Task types



The complete syntax of BPMN

Data:

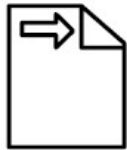
Data Objects:

Data Object	Data Objects provide information about what Activities require to be performed and/or what they produce. Data Objects can represent a singular object or a collection of objects. Data Input and Data Output provide the same information for Processes.	 <i>Collection</i> Data Input Data Output
--------------------	---	--

The complete syntax of BPMN

Data:

Data Objects:



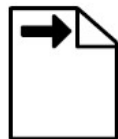
Data Input

White indicates that the data is being received.



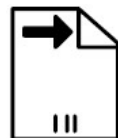
Collection Data Input

The additional annotation on the shape indicates that there are multiple items in the collection of data artifacts. An example could be a pile of documents.



Data Output

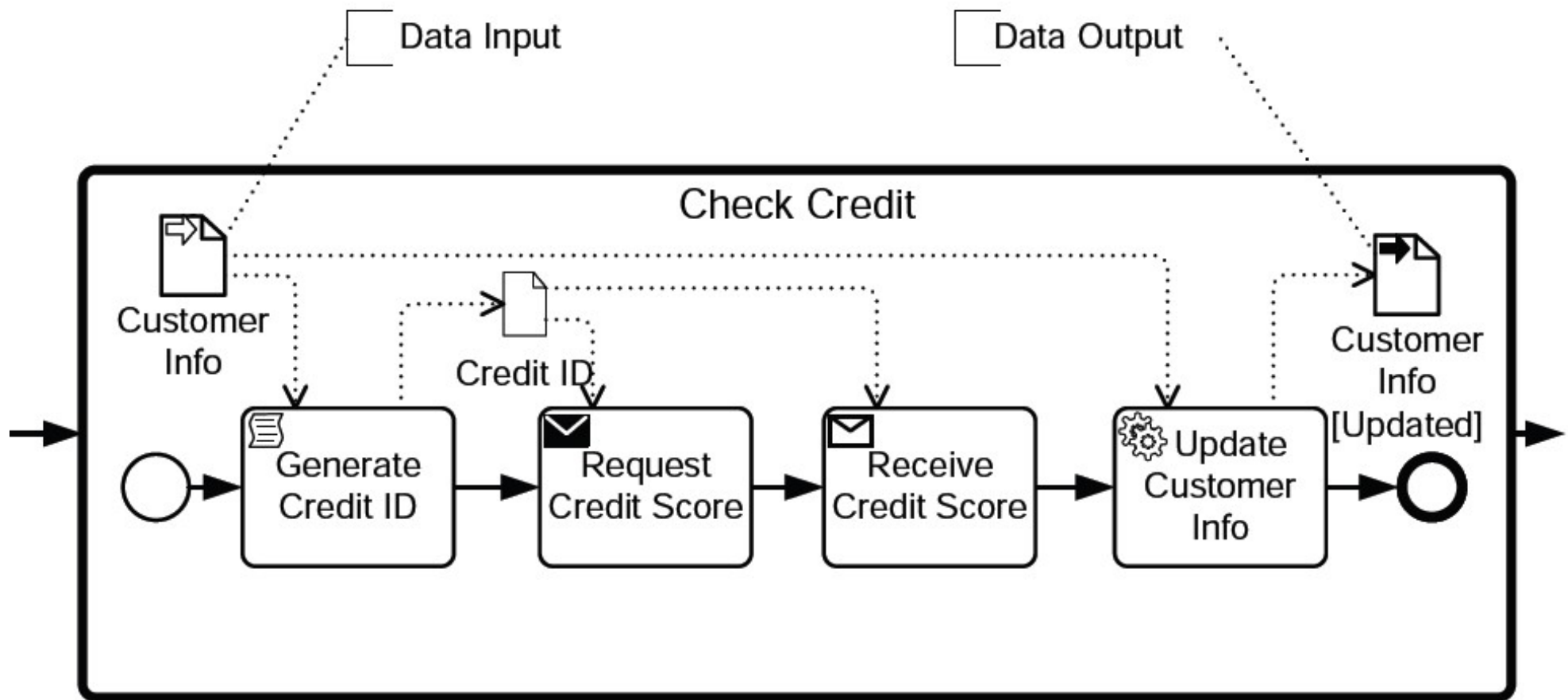
Black indicates that the data is being sent.



Collection Data Output

The complete syntax of BPMN

Examples: Data Objects



The complete syntax of BPMN

Data:

Data Stores:

The DataStore is introduced to represent persistent data shared by processes.

The Data Store is external to the process but has store/retrieve access to it.

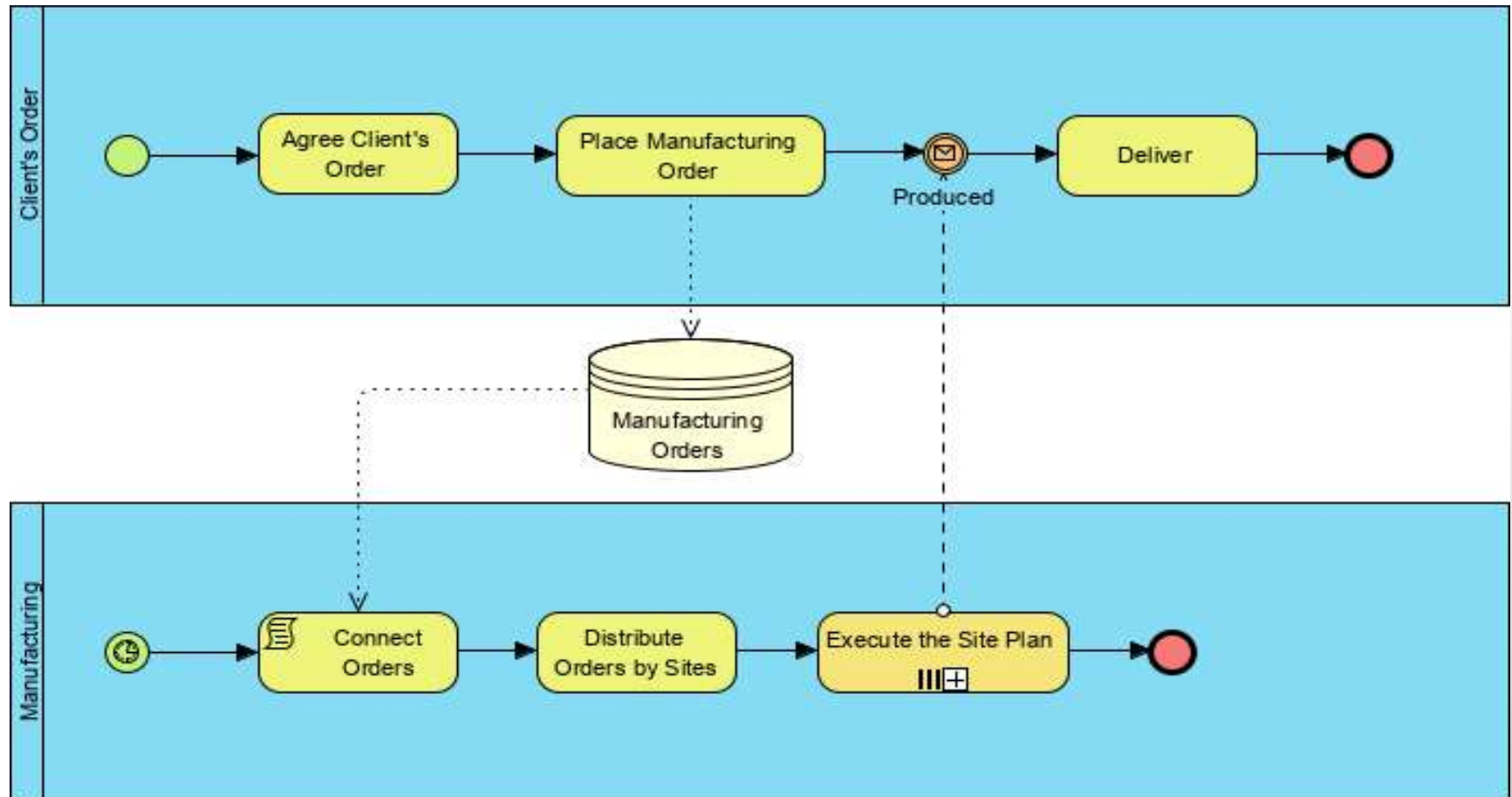
A Data Store provides a place in the Process where Activities can retrieve or update stored information that will persist beyond the scope of the Process.

The Data Store uses directional data association to show data flow to/from the process.



The complete syntax of BPMN

Examples: Data Stores



The complete syntax of BPMN

Data Objects versus Data Stores

In BPMN 1.x, a data object was just an “artifact”, effectively a decoration of the drawing with no associated semantics or rules.

That’s no longer the case.

In BPMN 2.0,



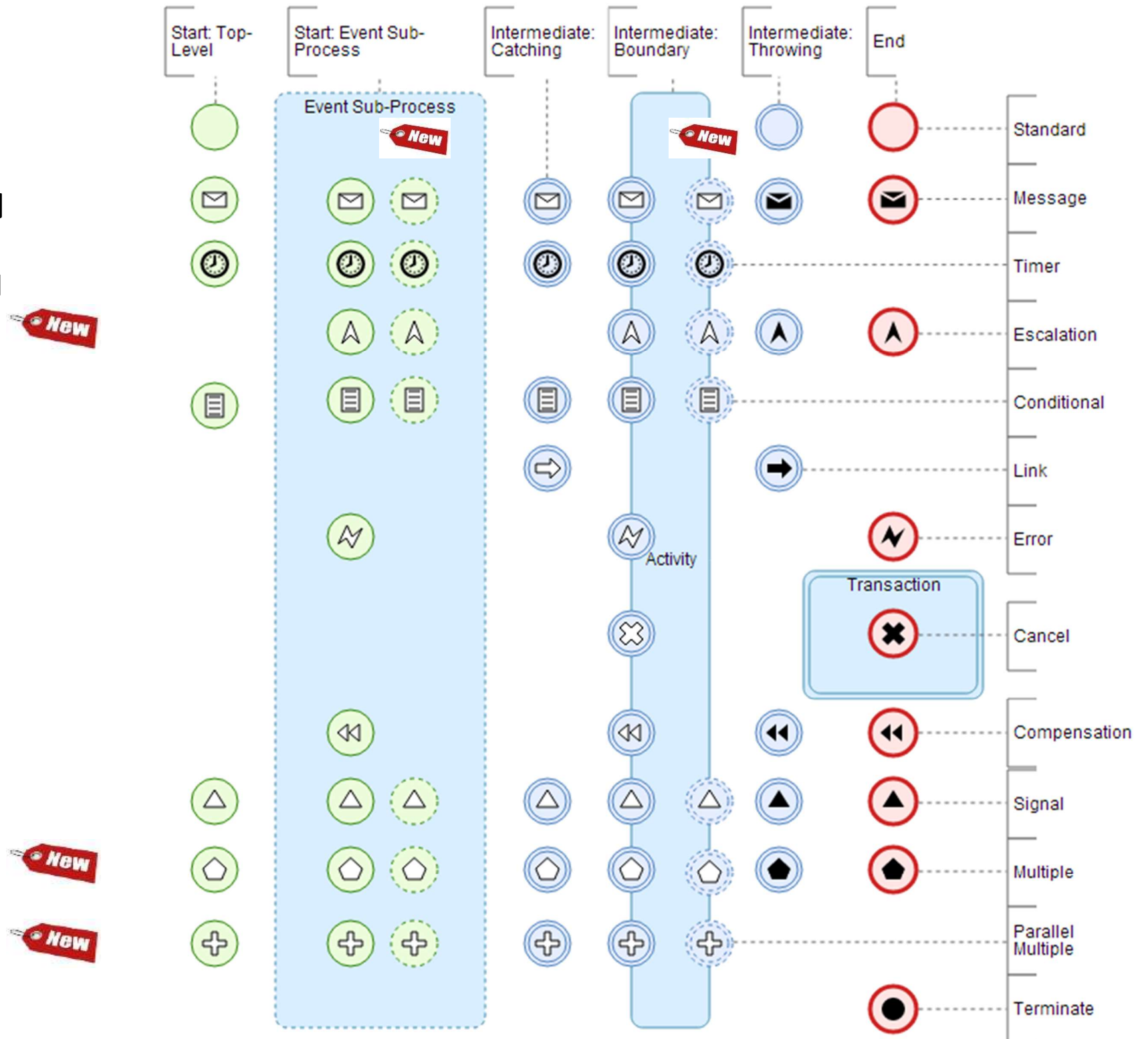
a data object is a variable stored within a process instance;



a data store is data stored outside of the instance, accessible to it but also from outside.

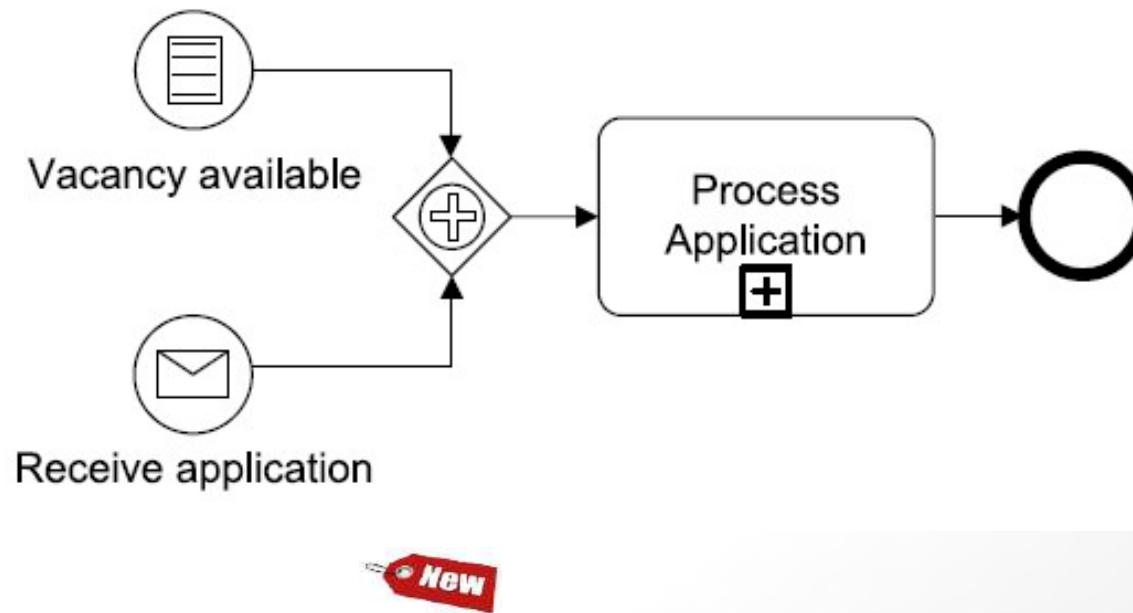
The complete syntax of BPMN

Types of Events and their Markers



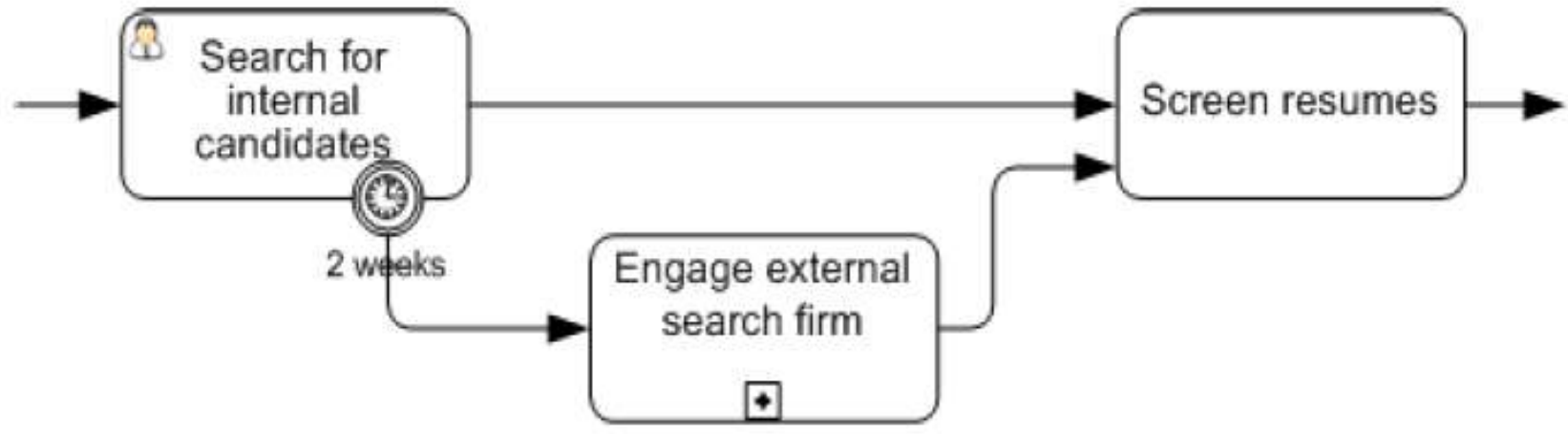
The complete syntax of BPMN

Example: Parallel Multiple Event

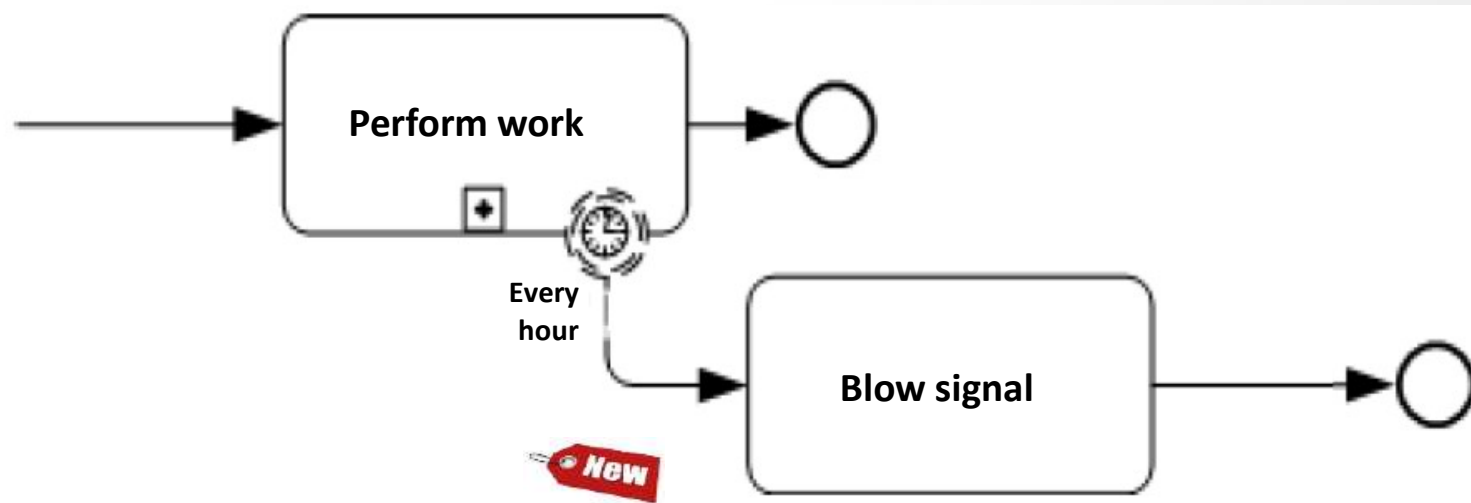


The complete syntax of BPMN

Example: Intermediate 'Interrupting' Timer Event

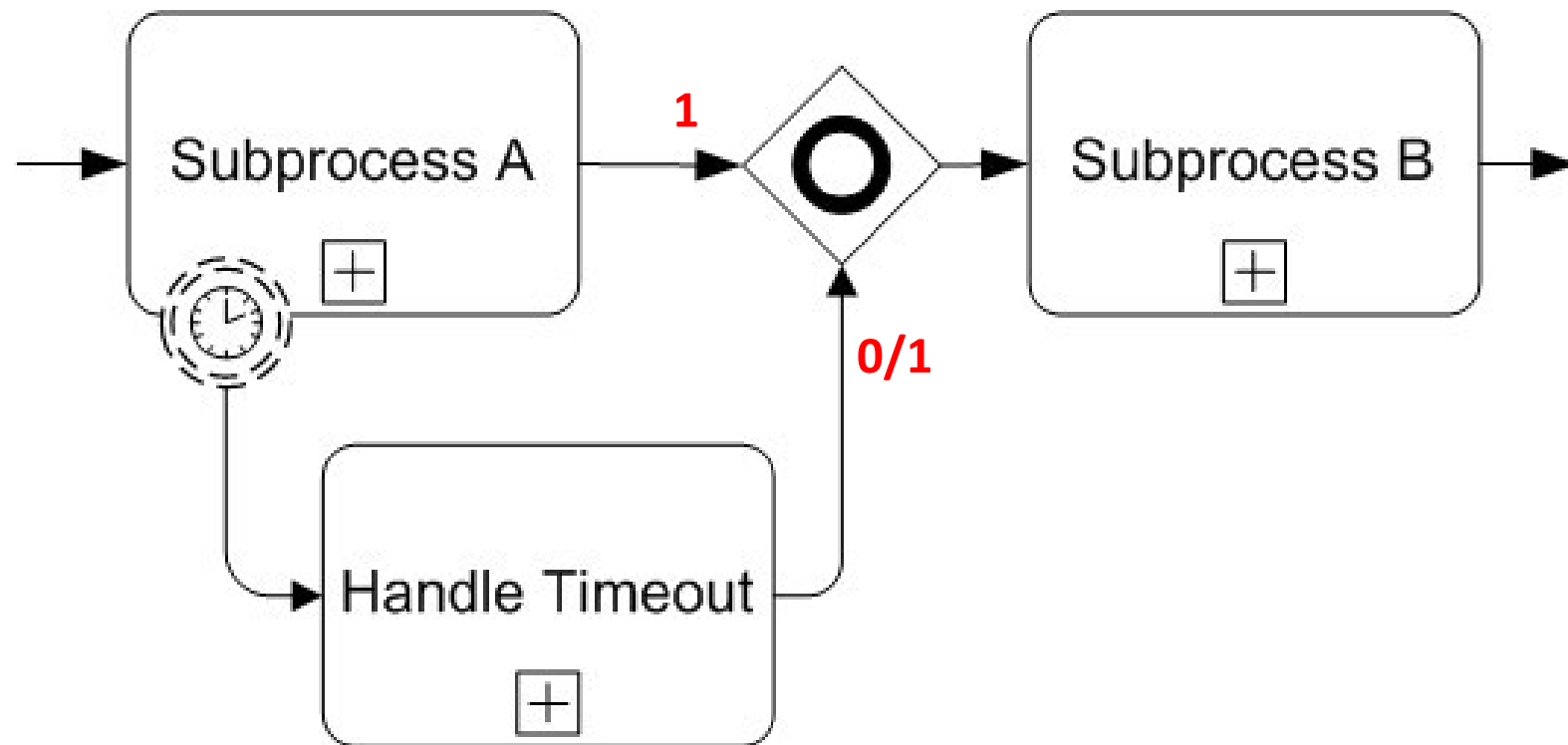


Example: Intermediate 'Non-interrupting' Timer Event



The complete syntax of BPMN

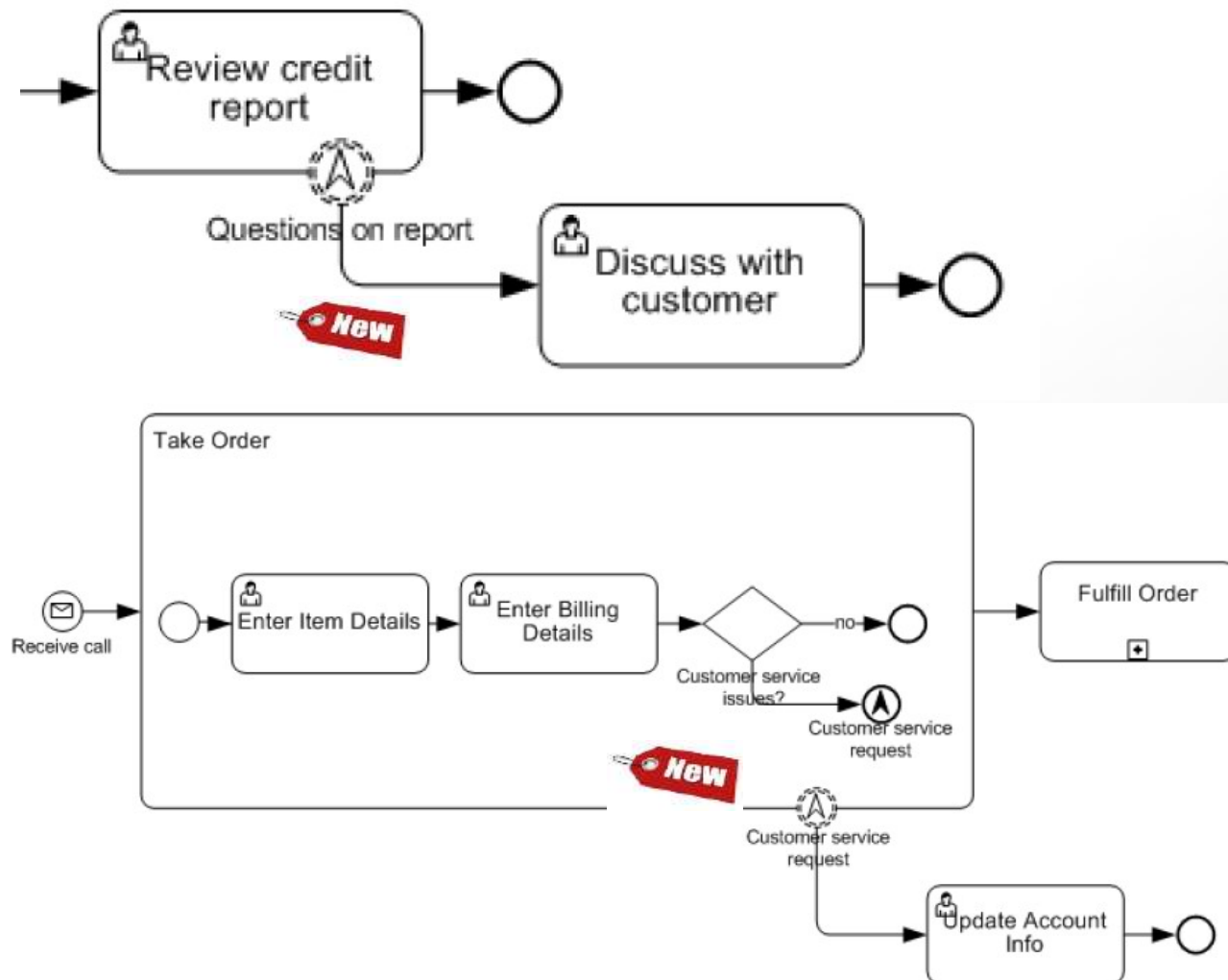
Example: Intermediate 'Non-Interrupting' Timer Event



The complete syntax of BPMN

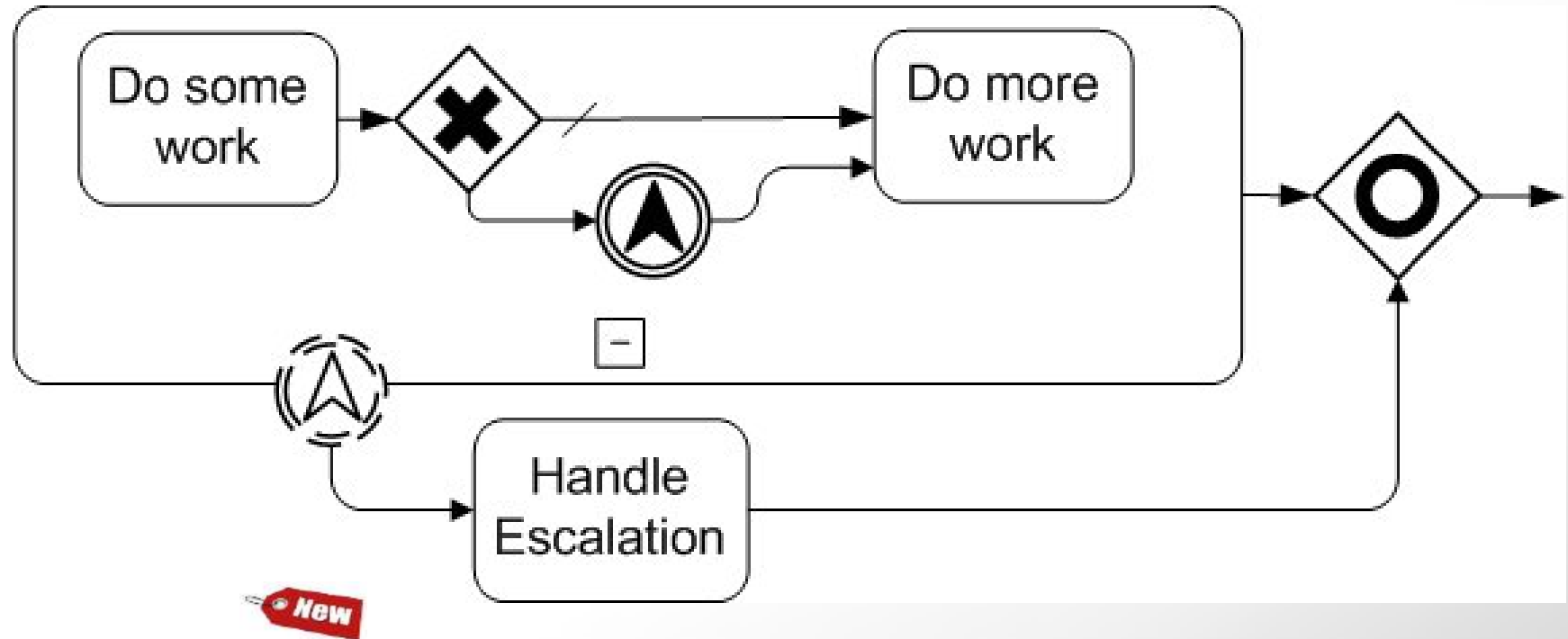
Example: Intermediate 'Non-interrupting' Escalation Event

On a User task, signifies “user action”.



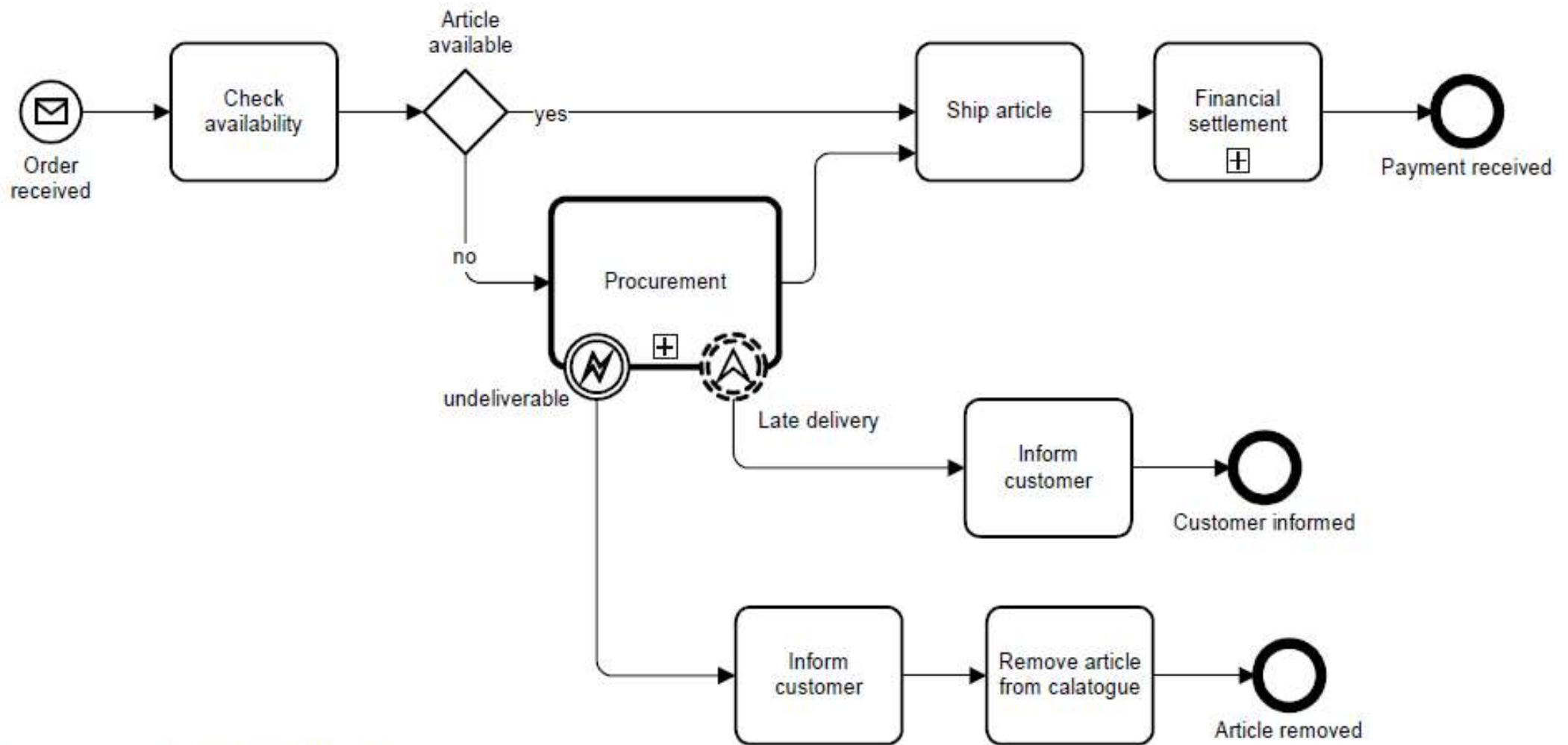
The complete syntax of BPMN

Example: Escalation Events Examples



The complete syntax of BPMN

Example: Non-interrupting Escalation event



Order Fulfillment

The complete syntax of BPMN

Message icon:

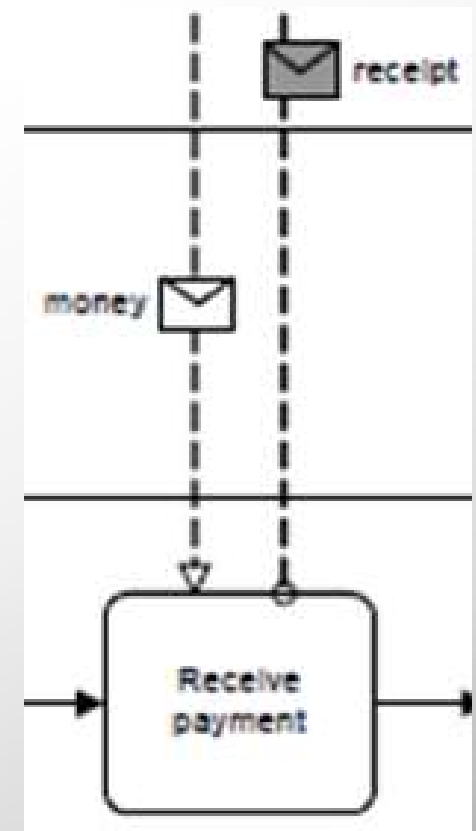
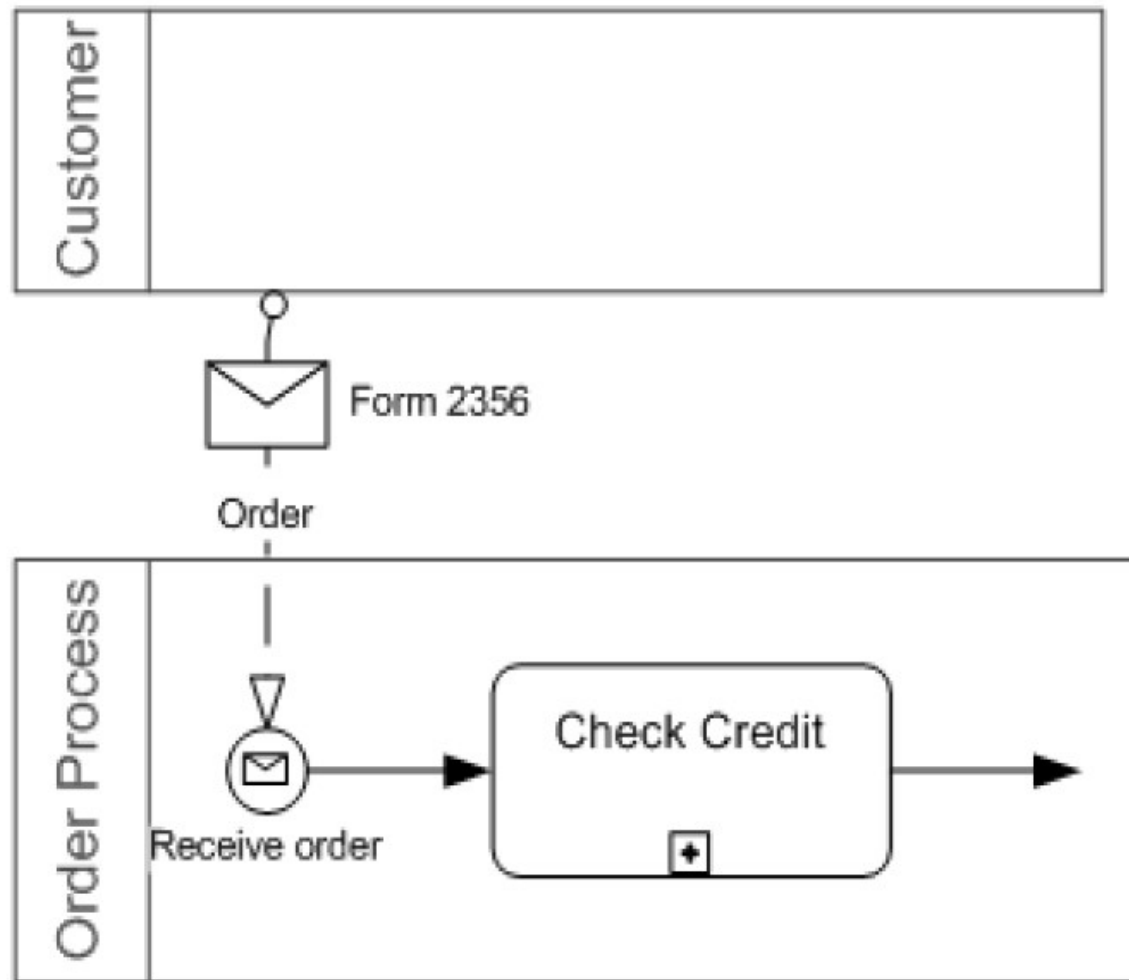
Use the Message icon to add message content detail.



Message	A Message is used to depict the contents of a communication between two <i>Participants</i> (as defined by a business <code>PartnerRole</code> or a business <code>PartnerEntity</code> –	
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The complete syntax of BPMN

Examples: Message icon



The complete syntax of BPMN 2.0

BPMN 1.x

Proces diagram

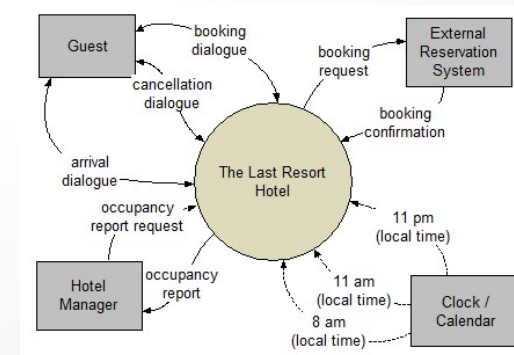
+

- The '(Business) Process Diagram' / BPD



Data diagram

- Data Flow diagram



BPMN 2.0

+

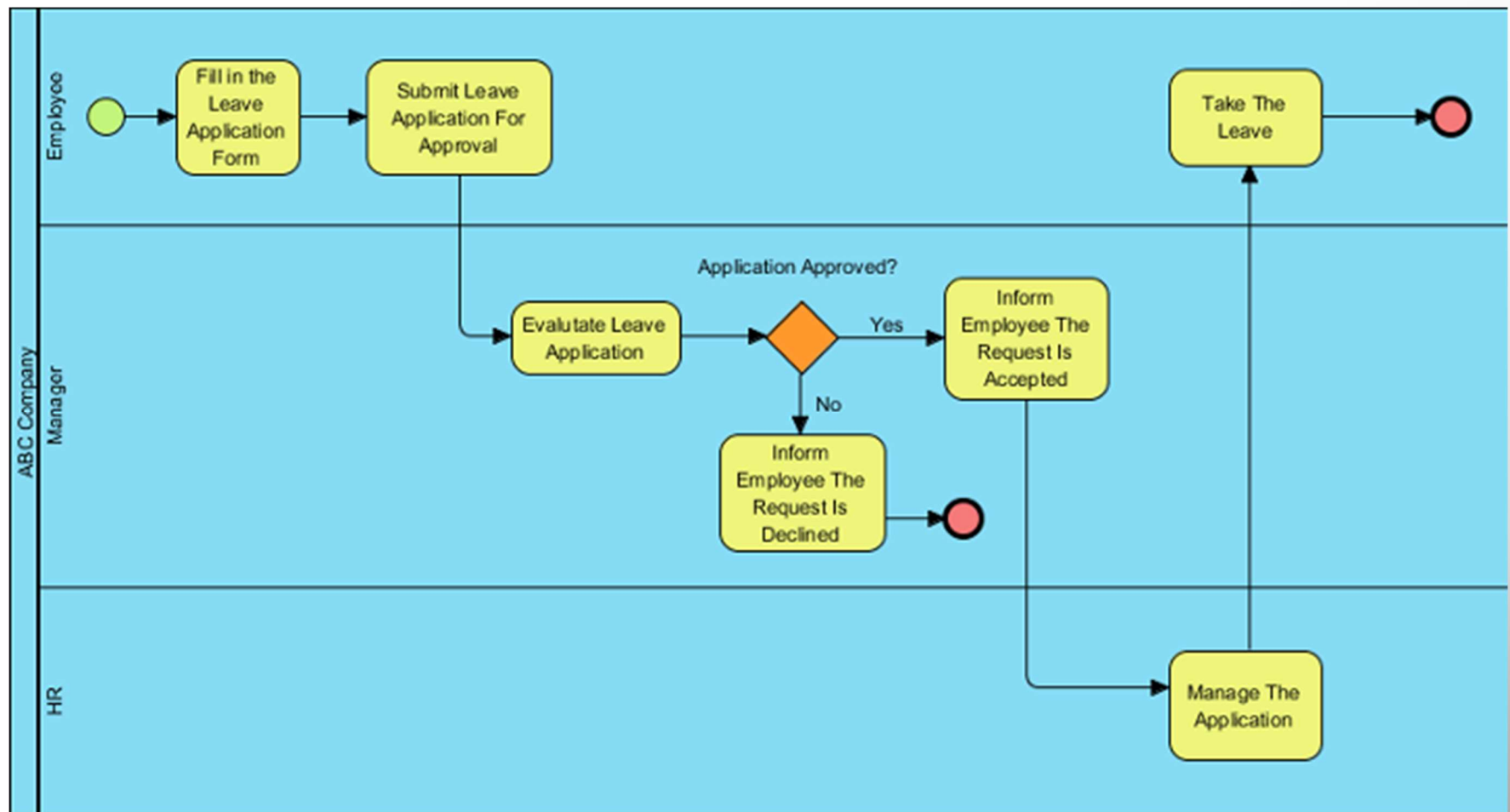
Data diagrams

- The 'Conversation diagram'
- The 'Collaboration diagram'
- The 'Choreography diagram'

The complete syntax of BPMN

1. (Business) Process diagram / BPD

See diagrams of BPMN 2.0 with the Graphical markers for individual Task types.



The complete syntax of BPMN

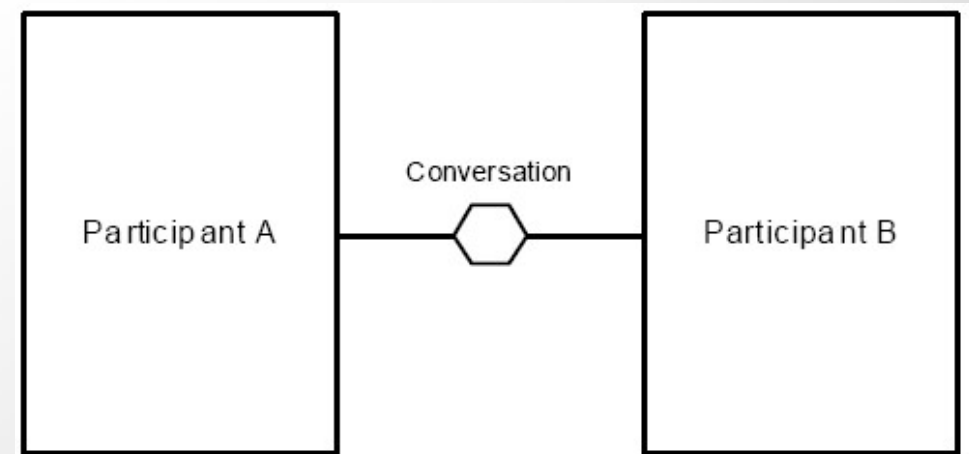
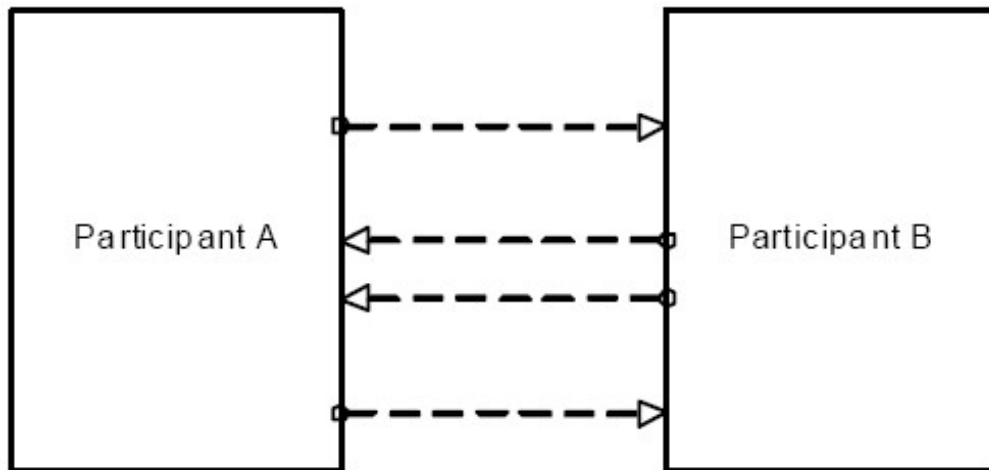
2. Conversation diagram

A conversation diagram where the Conversation is expanded into Message Flow.

A conversation diagram allows a modeler to group Collaboration interactions between two or more Participants, which together achieve a common goal, e.g. “negotiate delivery”.

The grouping can be based on business keys such as customer ID or shipping ID.

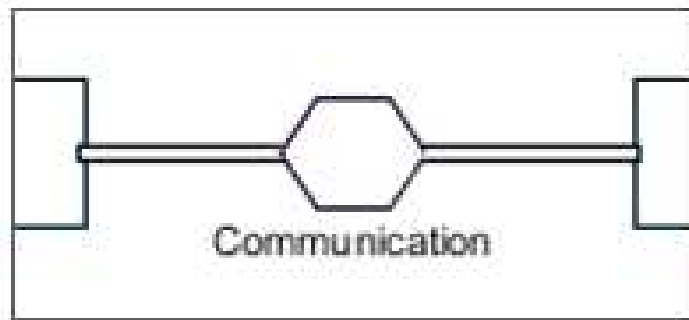
Conversation diagrams visualize messages exchange between pools.



The complete syntax of BPMN

2. Conversation diagram

Conversation Link

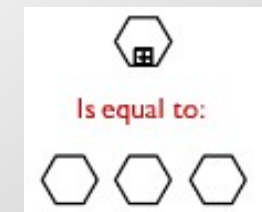


Communication or Conversation Links are used to connect ConversationNodes to and from Participants (Pools).

Sub-Conversation Link

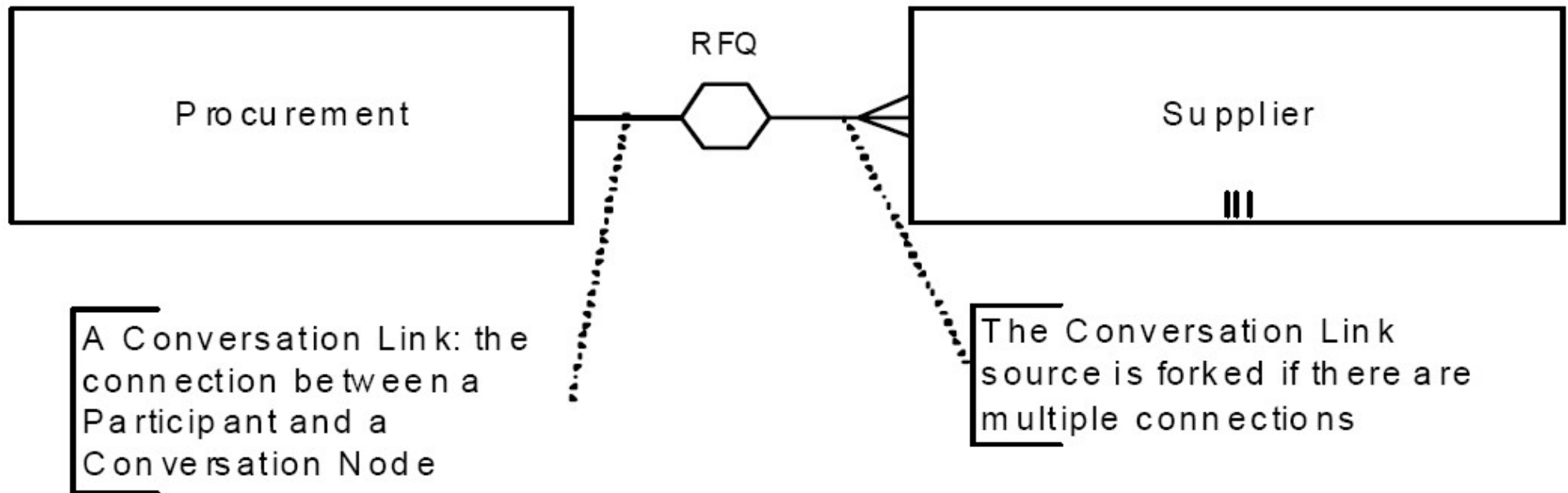


A Sub-Conversation is a ConversationNode that is a hierarchical division within the parent Conversation



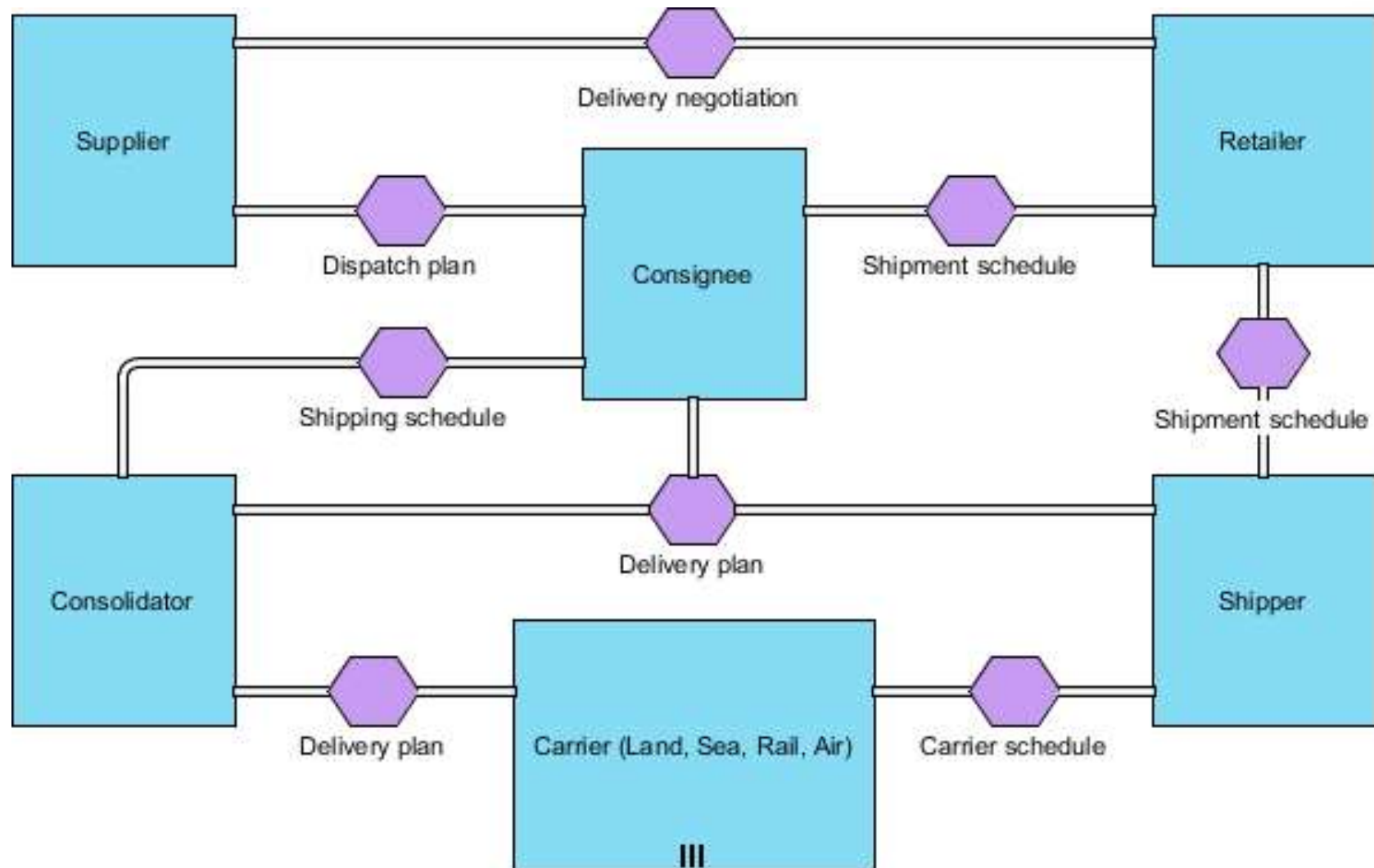
The complete syntax of BPMN

2. Conversation diagram



The complete syntax of BPMN

Example Conversation diagram

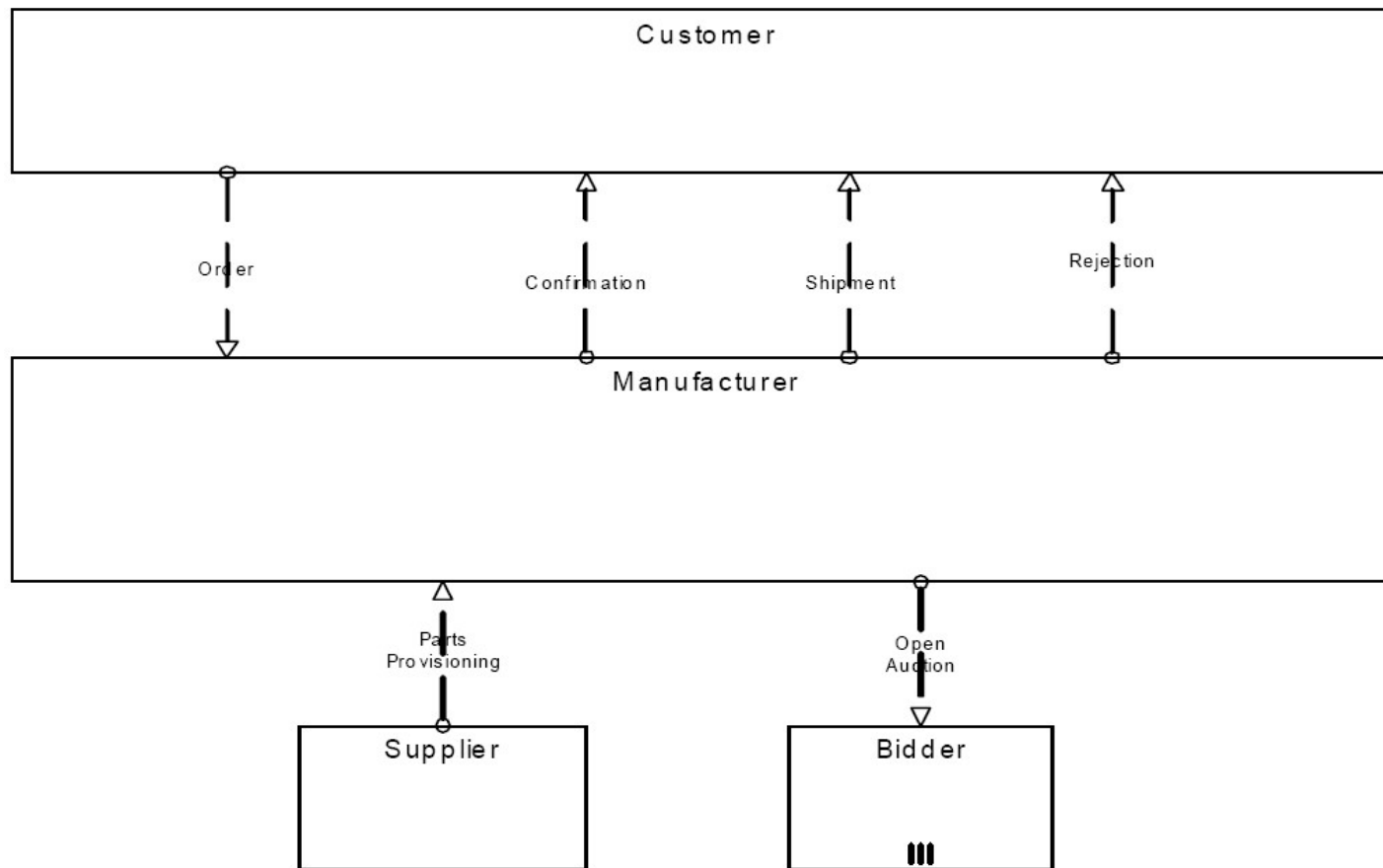


The complete syntax of BPMN

3. Collaboration diagram

In BPMN 1.x every process has a pool.

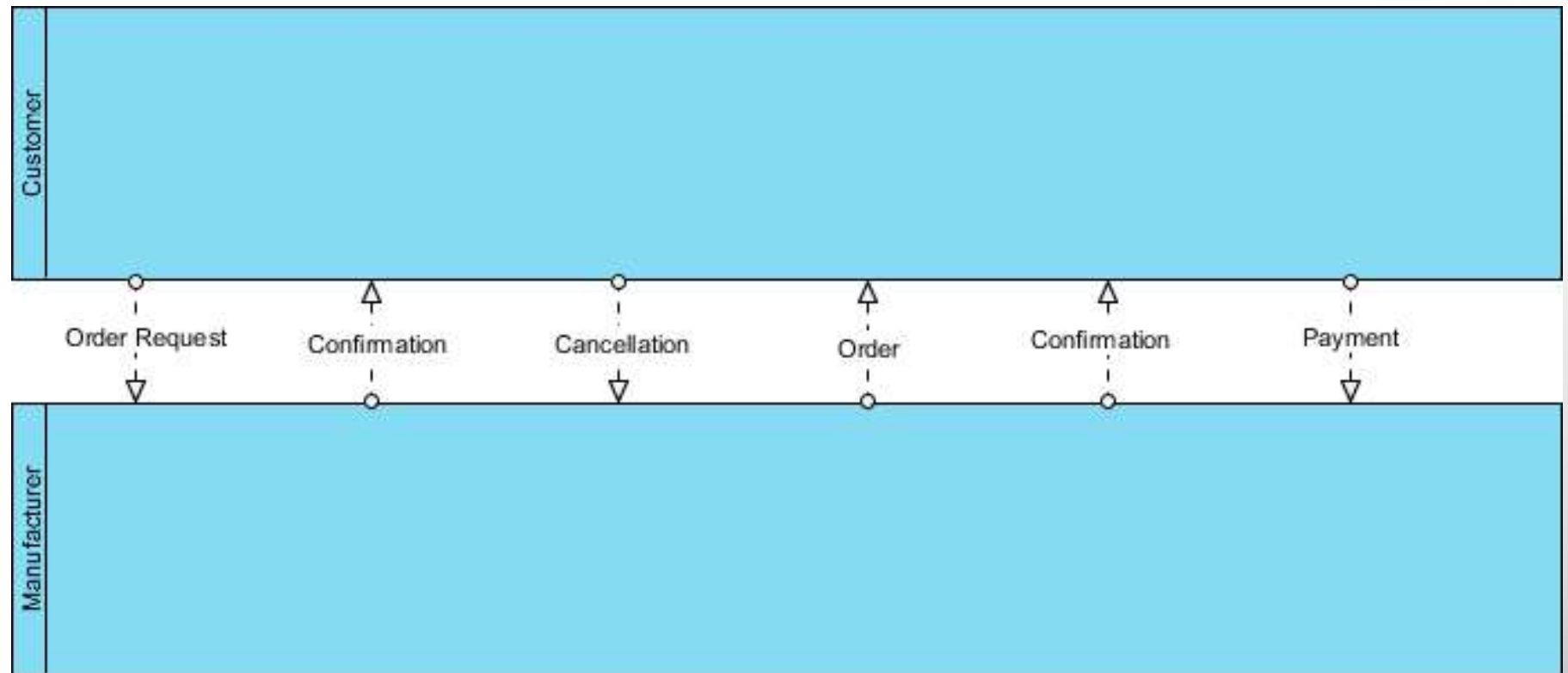
In BPMN 2.0 a pool is only defined for collaboration diagrams (message flows).



A pool with a Multi-Instance Participant Marker

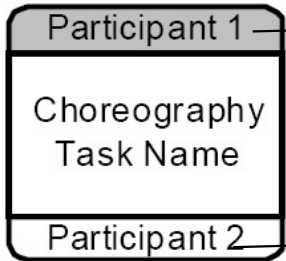
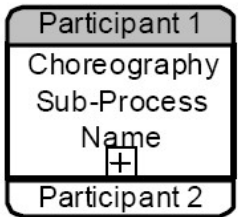
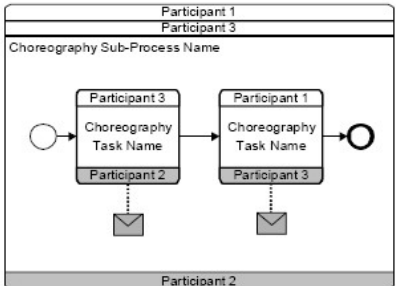
The complete syntax of BPMN

Example Collaboration diagram



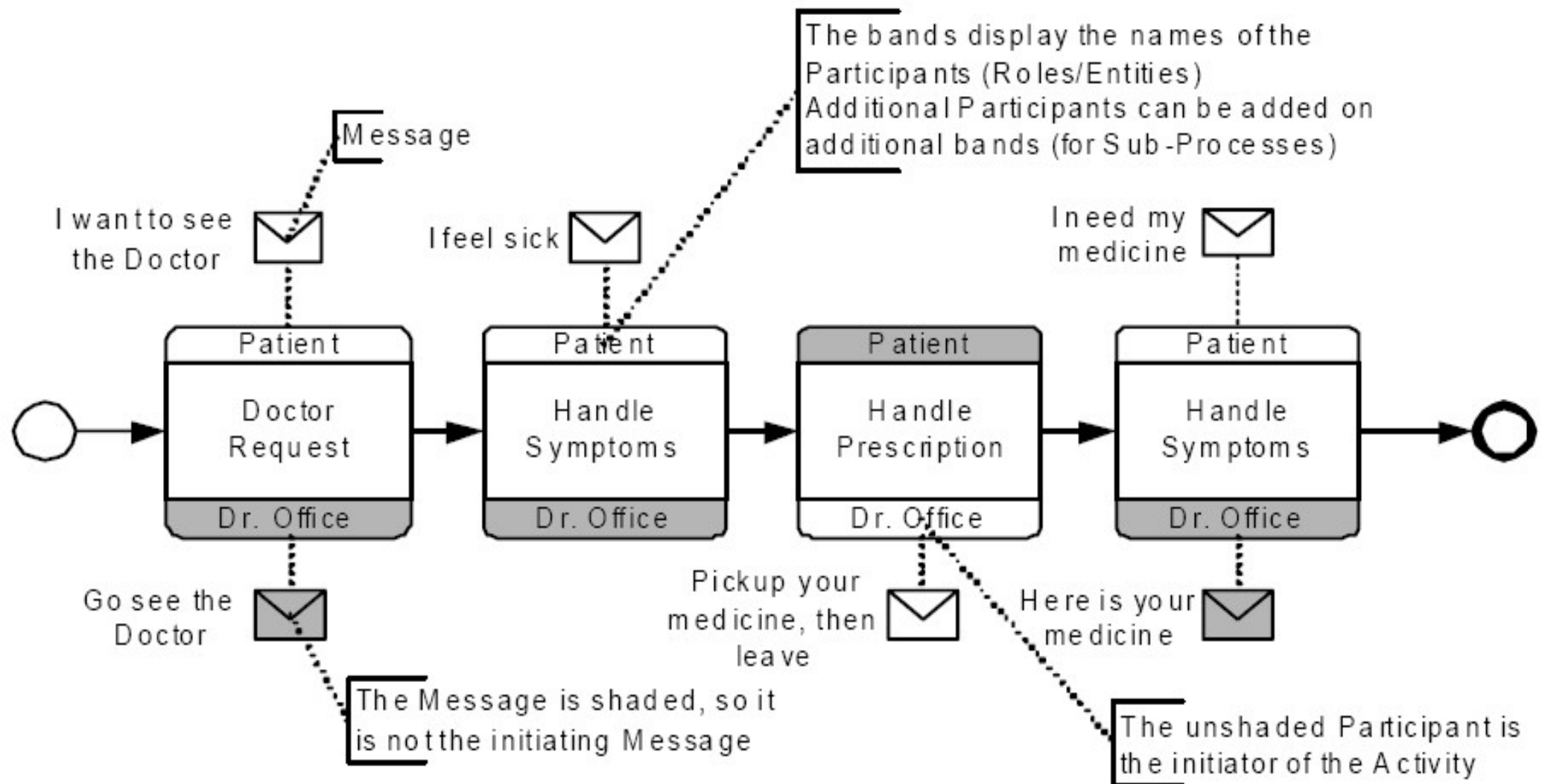
The complete syntax of BPMN

4. Choreography diagram

Choreography Task	A Choreography Task is an atomic Activity in a Choreography (see page 350). It represents a set of one (1) or more Message exchanges. Each Choreography Task involves two (2) or more <i>Participants</i> . The name of the Choreography Task and each of the <i>Participants</i> are all displayed in the different bands that make up the shape's graphical notation. There are two (2) more <i>Participant</i> Bands and one Task Name Band.	 The Message is shaded, so it is not the initiating Message The unshaded Participant is the initiator of the Activity
Collapsed Choreography Sub-Process	The details of the Choreography Sub-Process are not visible in the Diagram (see page 356). A "plus" sign in the lower-center of the Task Name Band of the shape indicates that the Activity is a Sub-Process and has a lower-level of detail.	
Expanded Choreography Sub-Process	The boundary of the Choreography Sub-Process is expanded and the details (a Choreography) are visible within its boundary (see page 356) Note that Sequence Flow cannot cross the boundary of a Choreography Sub-Process.	

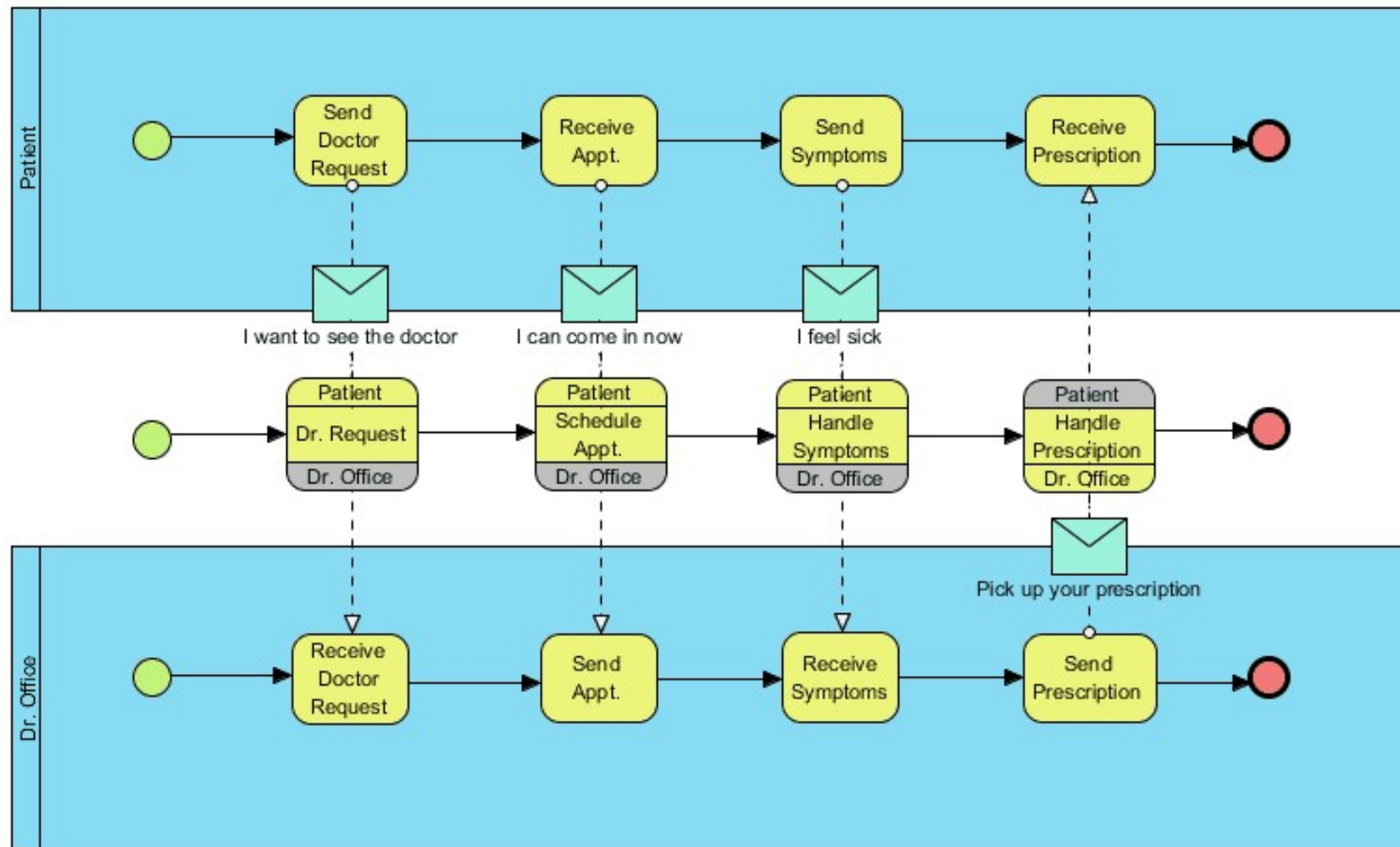
The complete syntax of BPMN

4. Choreography diagram



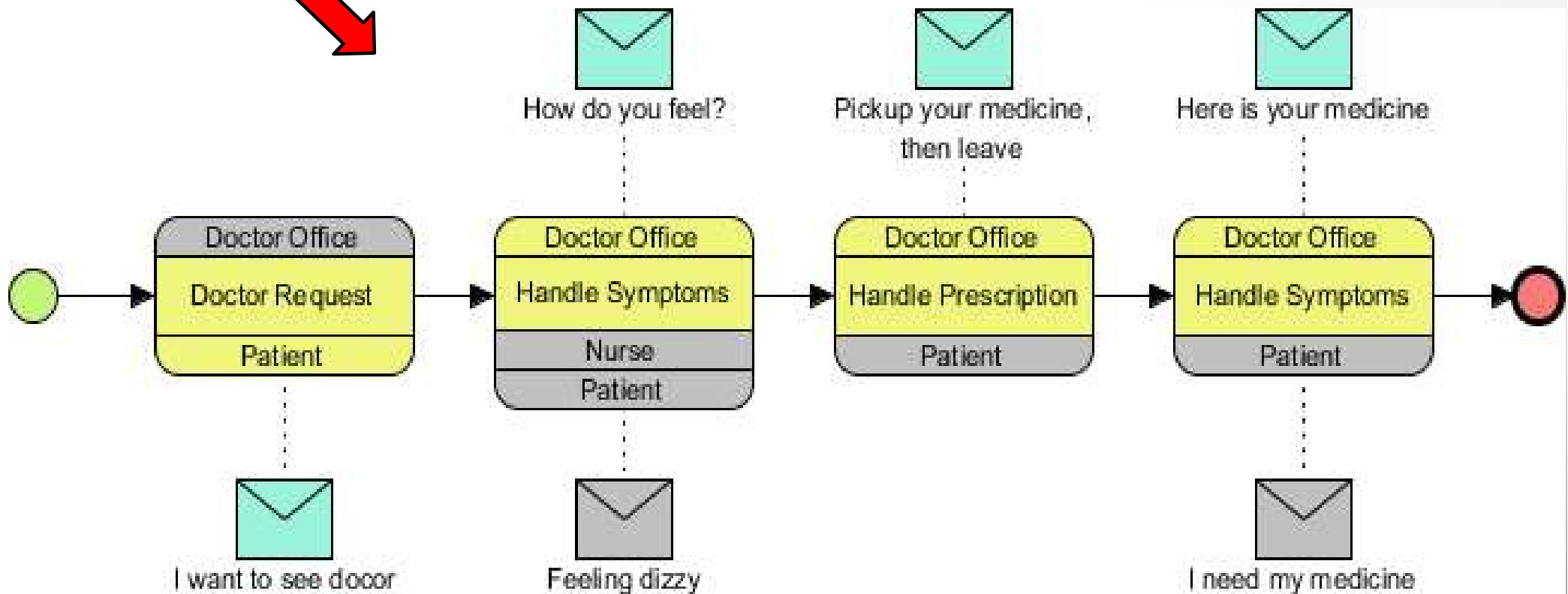
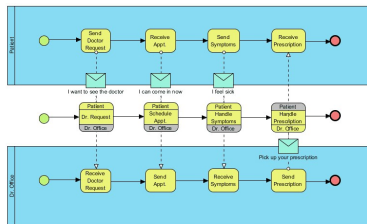
The complete syntax of BPMN

Example Choreography diagram (step 1)



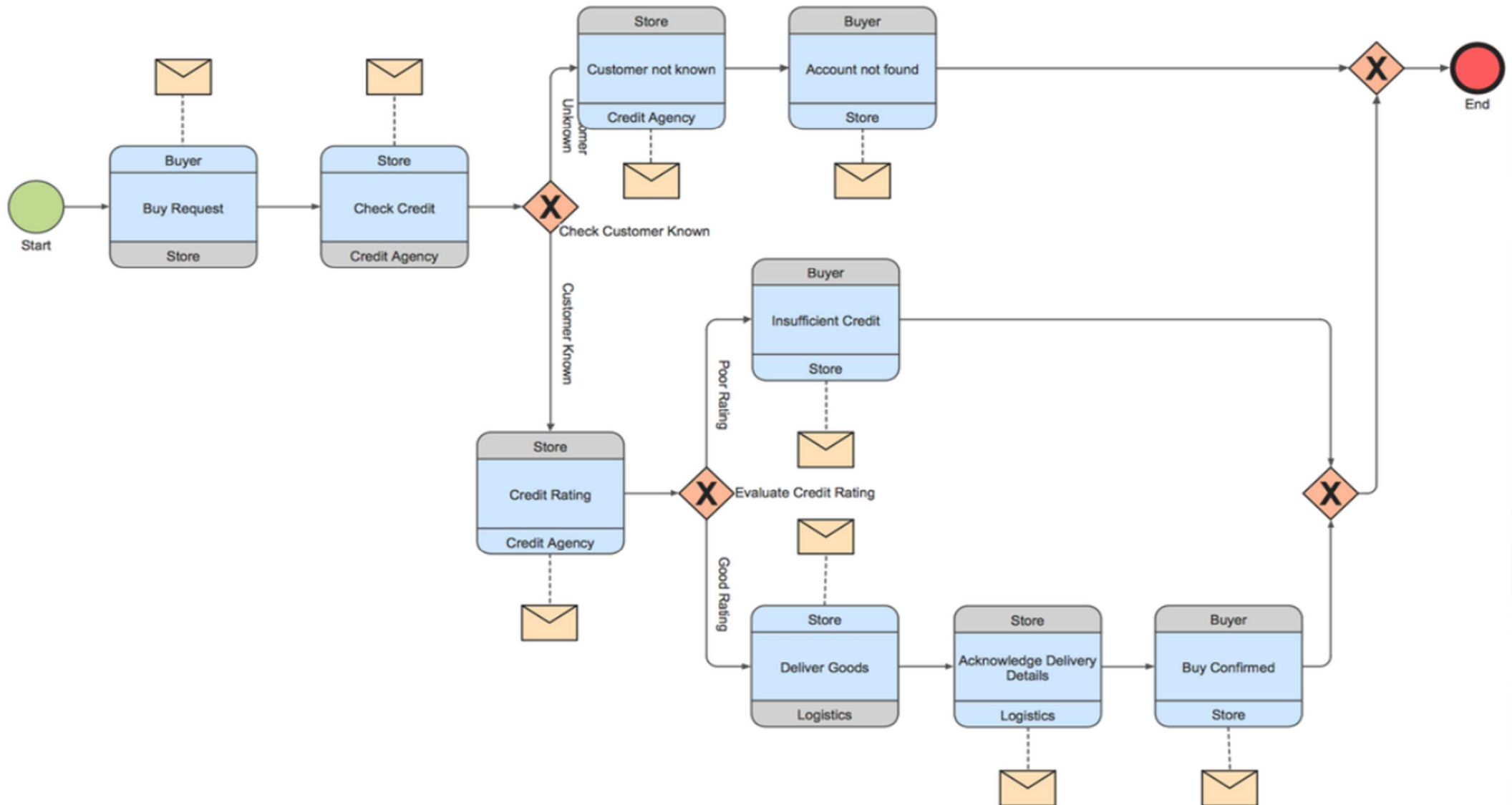
The complete syntax of BPMN

Example Choreography diagram (step 2)



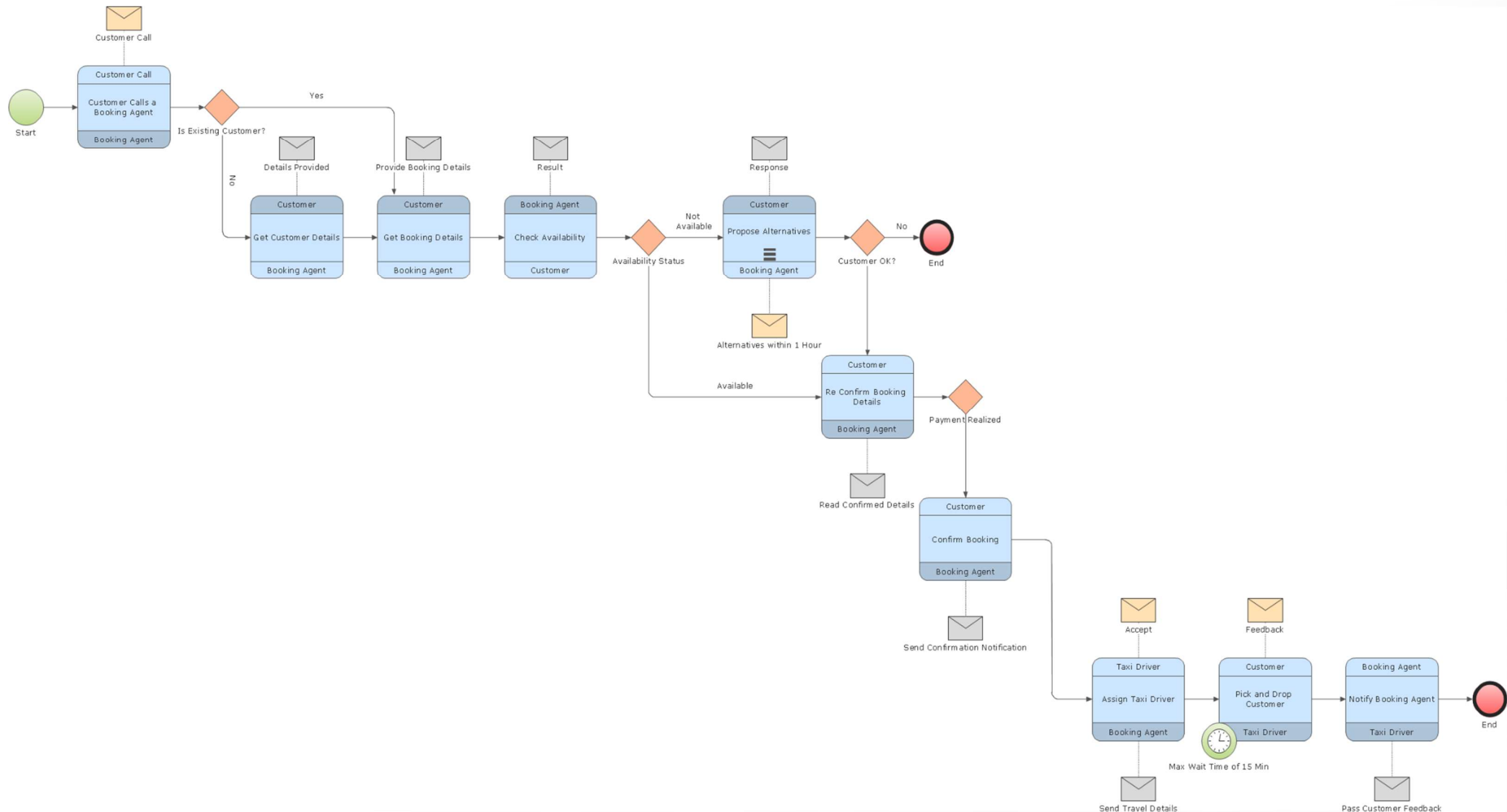
The complete syntax of BPMN

Example Choreography diagram 'Logistics'



The complete syntax of BPMN

Example Choreography diagram 'Booking'

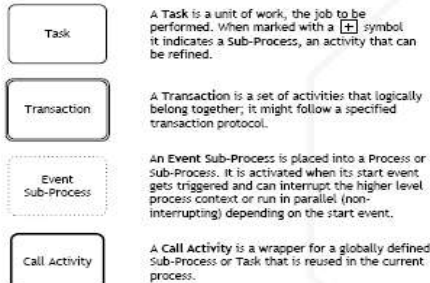


The BPMN Poster

BPMN 2.0 - Business Process Model and Notation

<http://bpmb.de/poster>

Activities



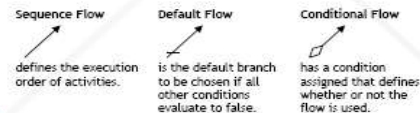
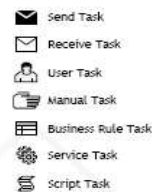
Activity Markers

Markers indicate execution behavior of activities:

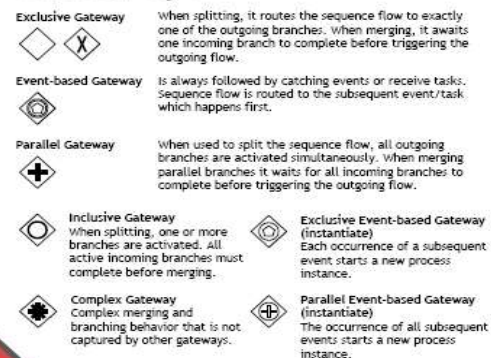


Task Types

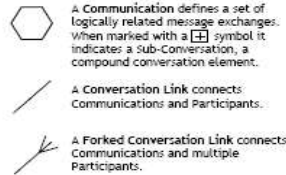
Types specify the nature of the action to be performed:



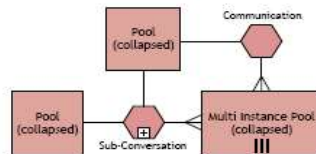
Gateways



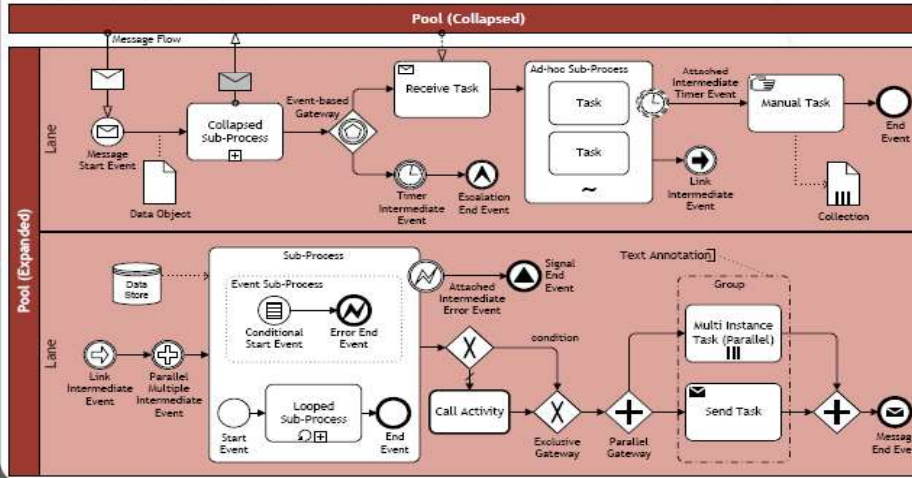
Conversations



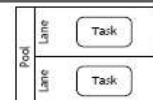
Conversation Diagram



Collaboration Diagram

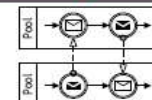


Swimlanes



Pools (Participants) and Lanes represent responsibilities for activities in a process. A pool or a lane can be an organization, a role, or a system. Lanes subdivide pools or other lanes hierarchically.

Message Flow symbolizes information flow across organizational boundaries. Message flow can be attached to pools, activities, or message events.

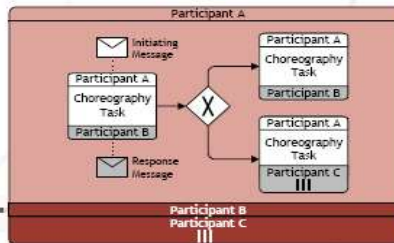


The order of message exchanges can be specified by combining message flow and sequence flow.

Choreographies



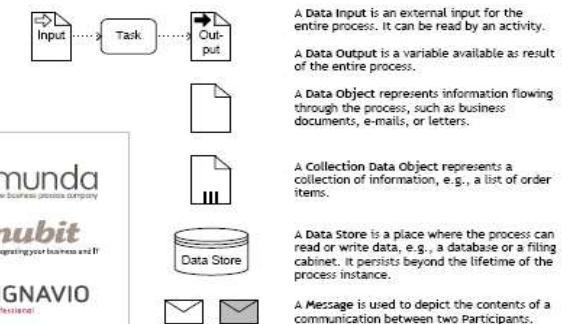
Choreography Diagram



Events

	Top-Level	Start	Intermediate	End
None: Untyped events, indicate start point, state changes or final states.				
Message: Receiving and sending messages.				
Timer: Cyclic timer events, points in time, time spans or timeouts.				
Escalation: Escalating to an higher level of responsibility.				
Conditional: Reacting to changed business conditions or integrating business rules.				
Link: Off-page connectors. Two corresponding link events equal a sequence flow.				
Error: Catching or throwing named errors.				
Cancel: Reacting to cancelled transactions or triggering cancellation.				
Compensation: Handling or triggering compensation.				
Signal: Signalling across different processes. A signal thrown can be caught multiple times.				
Multiple: Catching one out of a set of events. Throwing all events defined.				
Parallel Multiple: Catching all out of a set of parallel events.				
Terminate: Triggering the immediate termination of a process.				

Data



Part IV: What is DMN ?

- What is Decision Model Notation Standard

What is DMN / Decision Model Notation Standard?



DMN Model:

The **Decision Model Notation** is a way of representing business logic that is platform and technology independent.

DMN goals:

- Provide a **standard framework for decision model** types
- Provide **common notations** for decisions in business process models (i.e., BPMN)
- Provide for **interchangeability** for decision models and tables **among modeling tools**.

DMN RFP Task Force Team - Team:

- Christian De Sainte Marie / IBM Ilog
= **Large tool (BPM, BRMS etc) vendor**
- Jan Vanthienen / Katholieke Universiteit Leuven (BE)
= **Subject Matter Expert**
- Paul Vincent / TIBCO Software
= **Medium tool (CEP, BPM) vendor**

DMN

The Business Analysis: The Triple Crown



Processes

Cases

Decisions

Activities

Events

Rules

Transitional

Contextual

Applied

Data

Information

Knowledge

Procedural

Declarative

Functional

Token

Event Condition Action
(ECA)First Order Logic
(FOL)

Introduction of the Decision Model & Notation Model (DMN)[™] standard



December 2014 / OMG® Architecture Board officially approved the Decision Model & Notation[™] standard (DMN 1.0), a modeling notation for operational decisions that complements the popular BPMN 2.0 standard.

- Decision modeling, as a business user-friendly interface to rules management systems, has been popular for many years. DMN 1.0 now provides **a standard** to dissect decisions, relate it to input facts and describe detailed decision logic, for instance in the form of decision tables. It therefore **replaces proprietary approaches** that have dominated the field of Decision Management so far and provides extensibility into areas such as big data analytics.

- DMN 1.0 was approved by the **Object Management Group® (OMG)**, the standardization body that is also responsible for **BPMN** and **UML**. Indeed, the relationship between **DMN 1.x** and **BPMN 2.x** is **very close**: BPMN Rule Tasks can be refined using DMN, potentially influencing the routing logic of a process. On the other hand, DMN can also **be used on its own** to model operational business decisions.

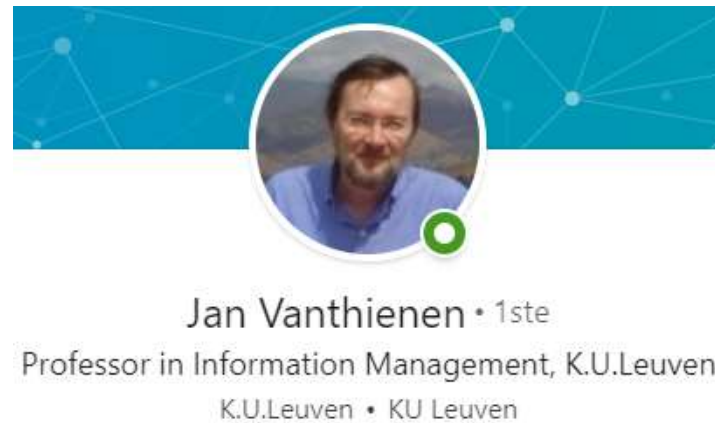
- DMN defines an XML format and is executable on Decision/Business Rules Engines.



Introduction of the Decision Model & Notation Model (DMN)TM standard

■ *“The DMN standard features the best of what we know about business decision rules”, says **Jan Vanthienen**, a pioneer of decision tables and decision logic modeling since the 1980s.*

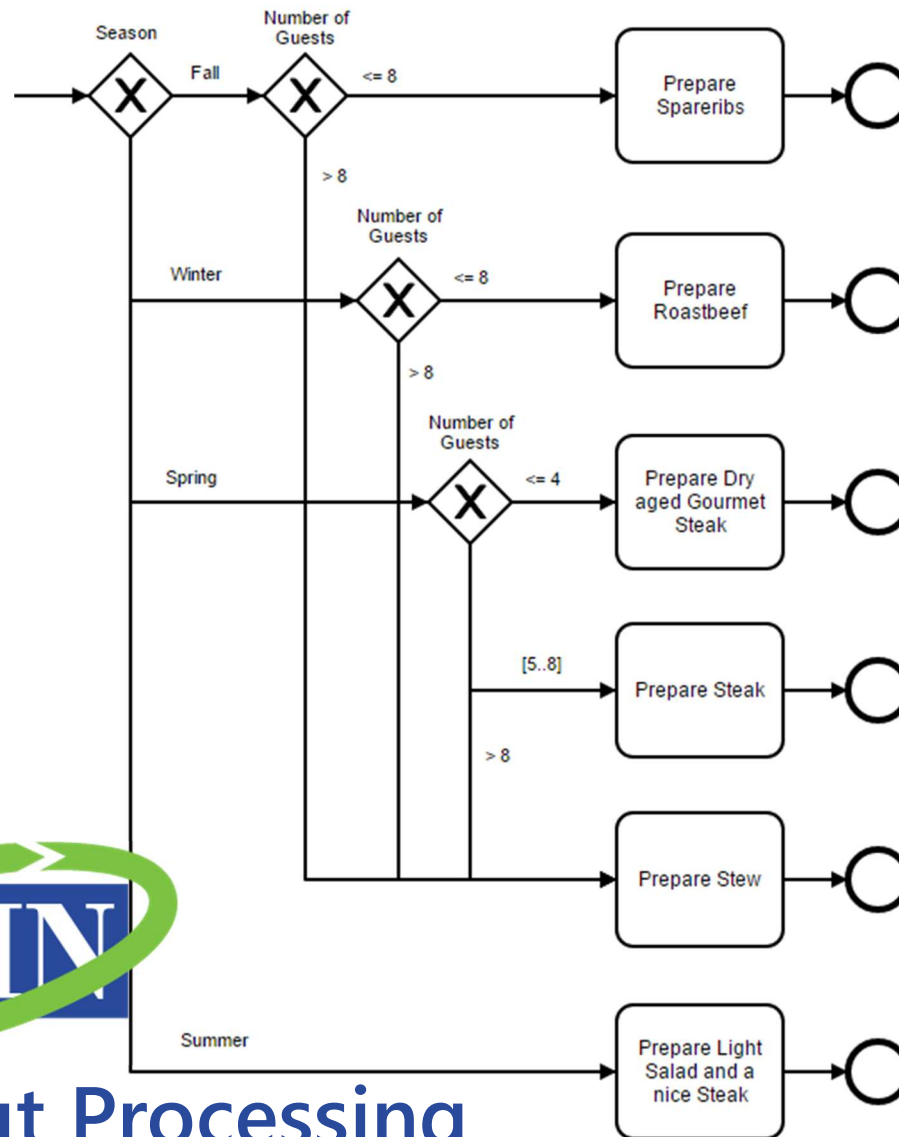
The **Belgian Professor** from **KU Leuven** is one of the contributors behind the DMN standard.



The approval of DMN 1.0 opens decision modeling to a broad audience. In particular, the combination with BPMN 2.0 gives organizations a strong tool for improving and innovating business operation. The standard provides a firm base to define methods and working techniques for Business Decision Management.

Integration with Business Processes in BPMN 2.0

If we define this example below in **BPMN**:



The sorrow is obvious: It's way more verbose to express rules in BPMN, especially when there are several conditions to consider.

The diagram becomes complex and hard to maintain.

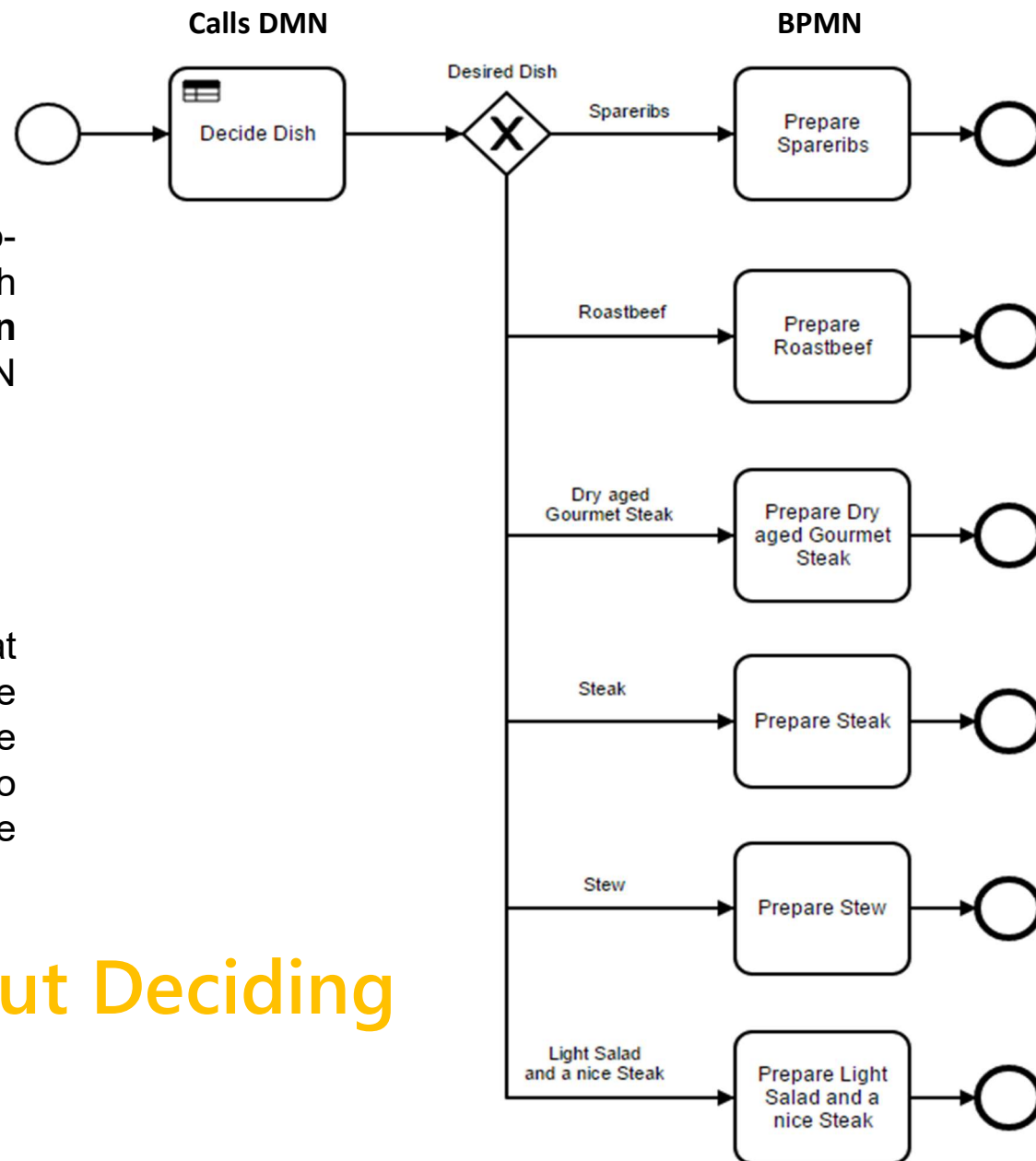
BPMN
is a about Processing

Integration with Business Processes in BPMN 2.0

That is why BPMN includes a so-called **business rule task**, which should better be named **decision task** in a later version of the BPMN standard.



That task refers to a decision that needs to be made, and the outcome of the decision allows the subsequent **exclusive gateway** to route the flow, as you can see in the example.



is a about Deciding
DMN

Integration with Business Processes in BPMN 2.0

That is why BPMN includes a so-called **business rule task**, which should better be named **decision task** in a later version of the BPMN standard.



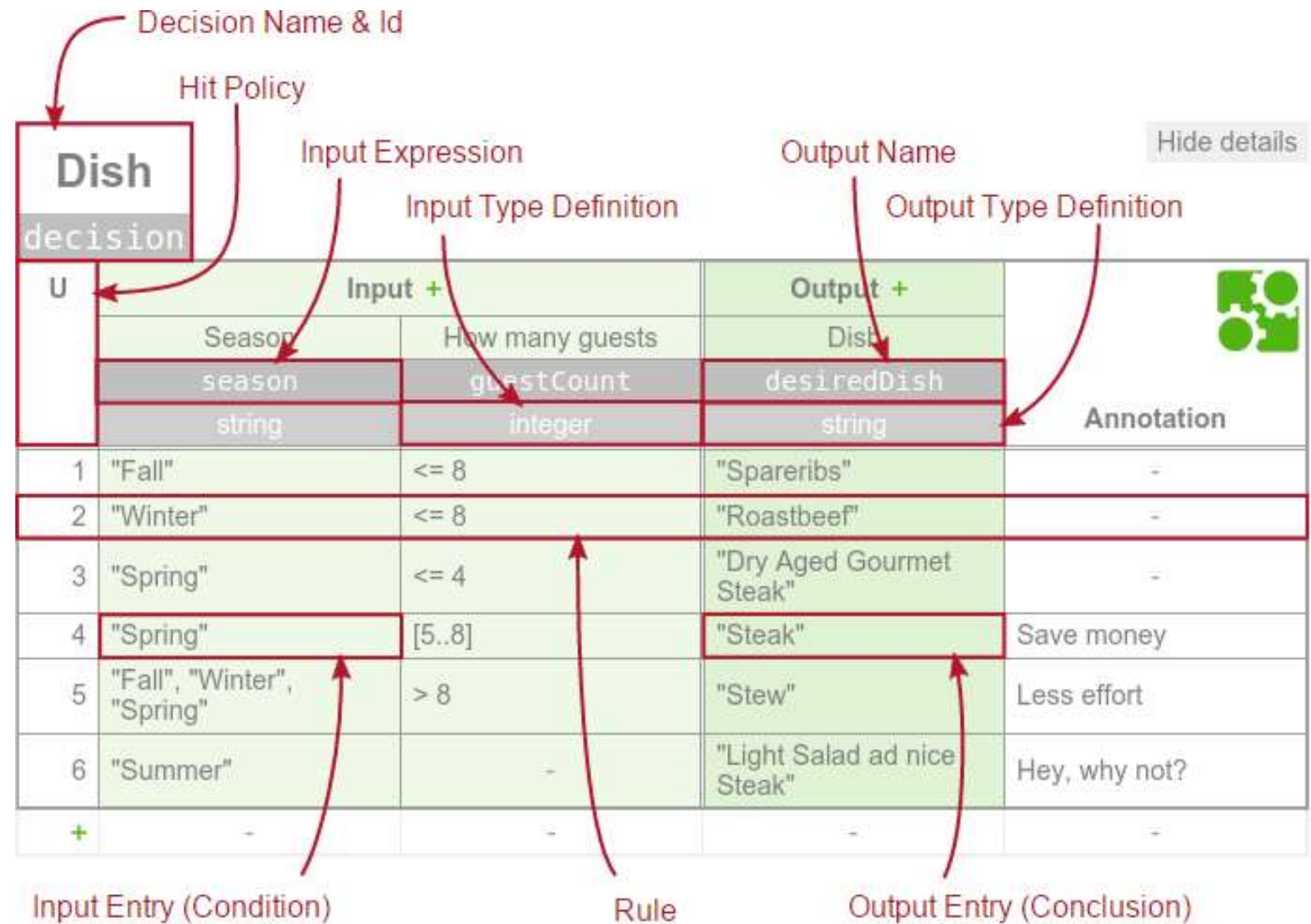
Dish				
U	Input +			Output +
	Season	How many guests	-	Dish
	string	integer	string	string
:: 1	"Fall"	6	-	"Spareribs"
:: 2	"Winter"	<= 8	-	"Roastbeef"
:: 3	"Spring"	<= 4	-	"Dry Aged Gourmet Steak"
:: 4	"Spring"	[5..8]	-	"Steak"
:: 5	"Fall", "Winter", "Spring"	> 20	-	"Stew"
:: 6	"Summer"	-	-	"Light Salad and a nice Steak"

That task refers to a decision that needs to be made, and the outcome of the decision allows the subsequent **exclusive gateway** to route the flow, as you can see in the example.



is a about Deciding
DMN

BPMN versus DMN / Decision Model Notation Standard

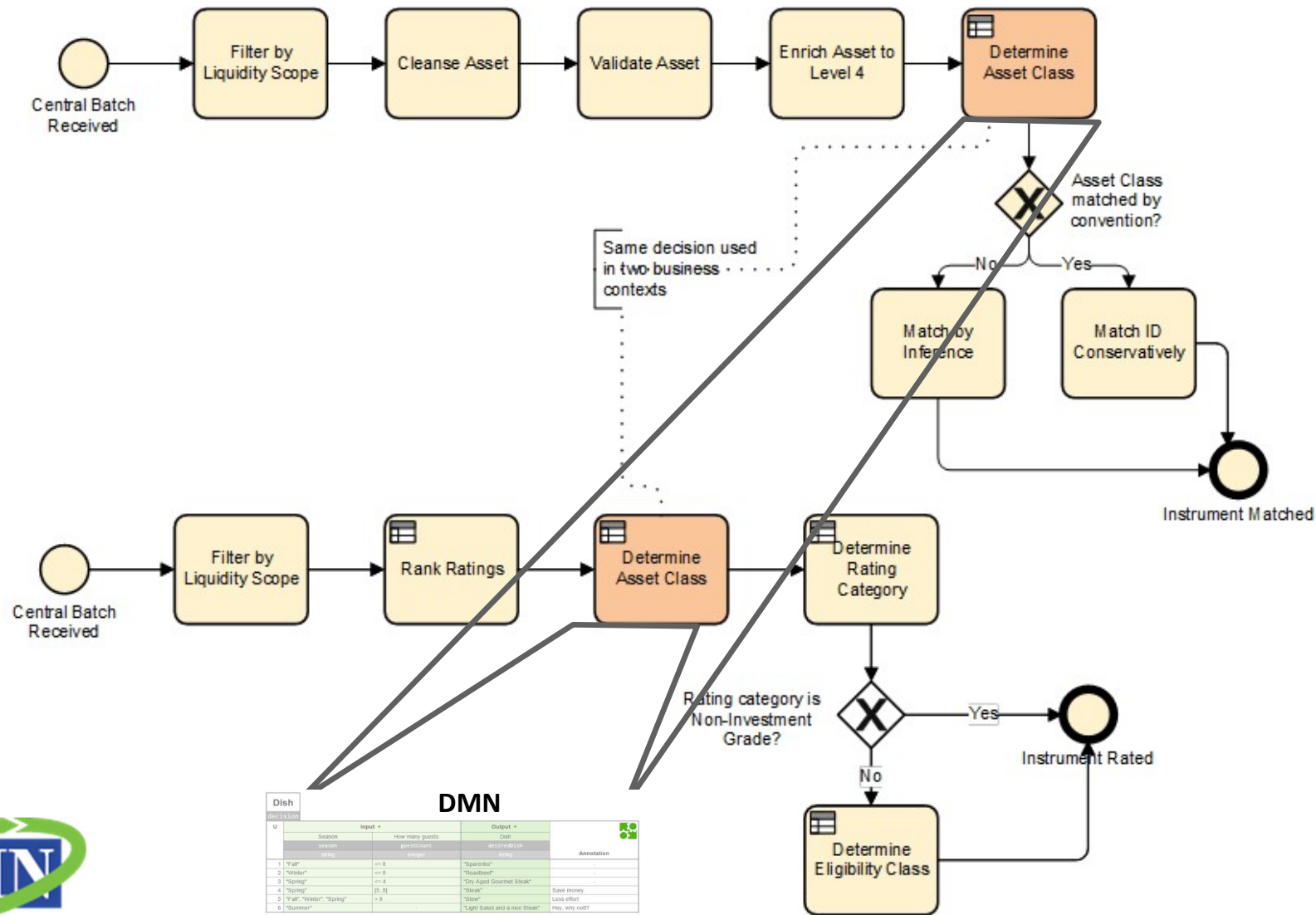


DMN

is a about Deciding

Integration with Business Processes in BPMN 2.0

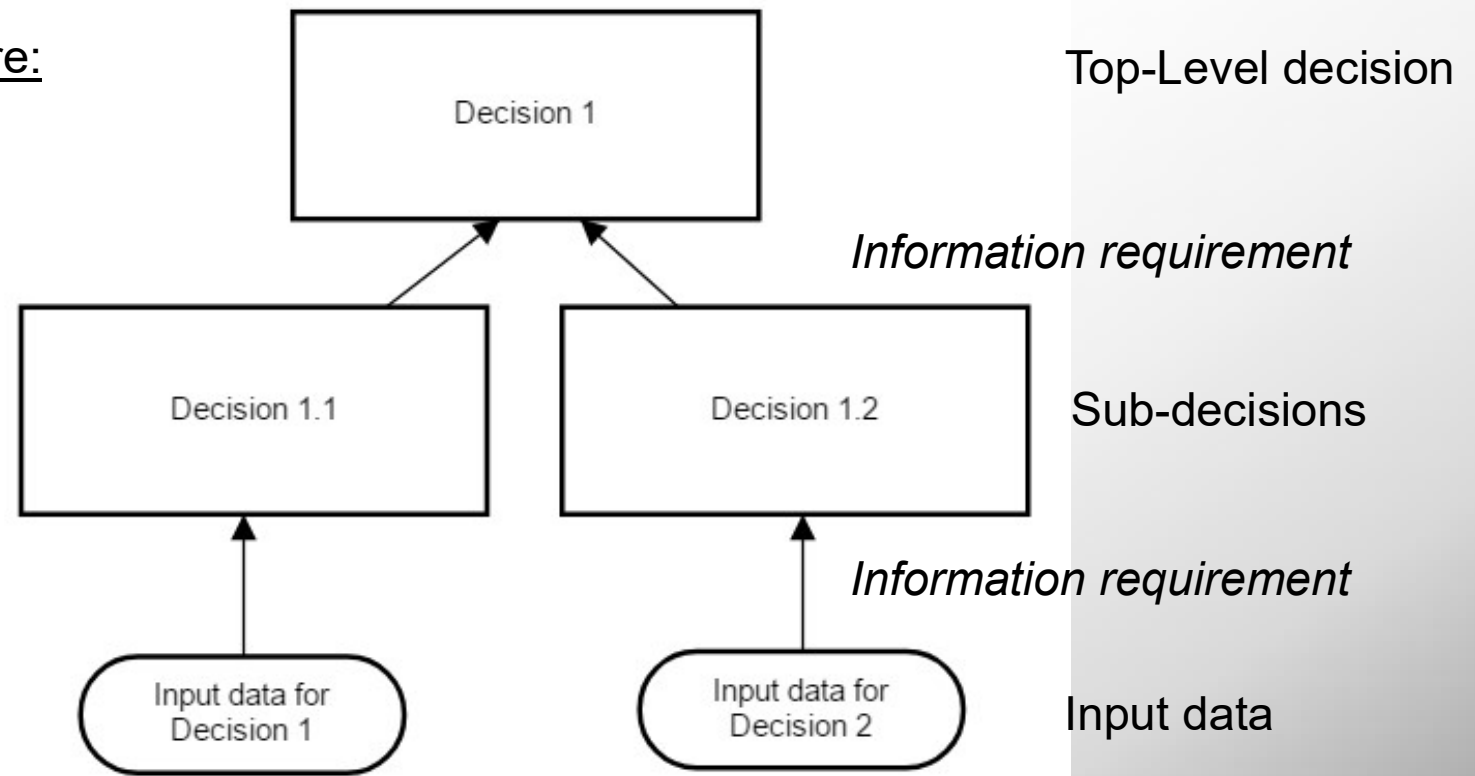
Re-use of decision-tasks in BPMN:



Layer 1: DRD / DECISION REQUIREMENT DIAGRAM

- **Input Data:** The input data that you "feed" into your decision logic in order to determine the output value.
- **Information requirements:** You can connect input data with arrows and therefore indicate which input data will be considered as an input for a decision.

The structure:

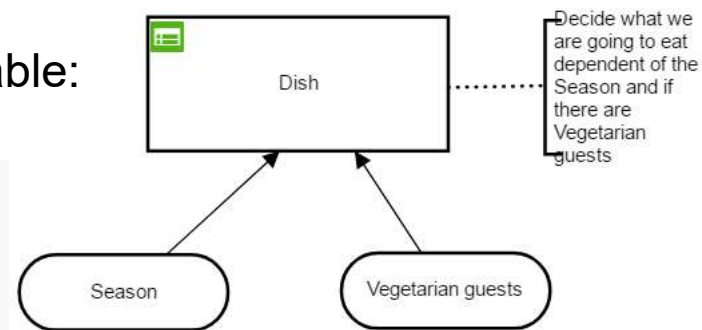


Layer 2: DECISION TABLE

In many cases a rule will not only consist of one condition, but a **combination of conditions**.

We can express that by adding input columns to the decision table. In this case we may want to consider guests that are **vegetarian**. Regardless of the season, **we cannot serve them any meat**. Fortunately, we always have some **pasta** available.

A simple decision table:



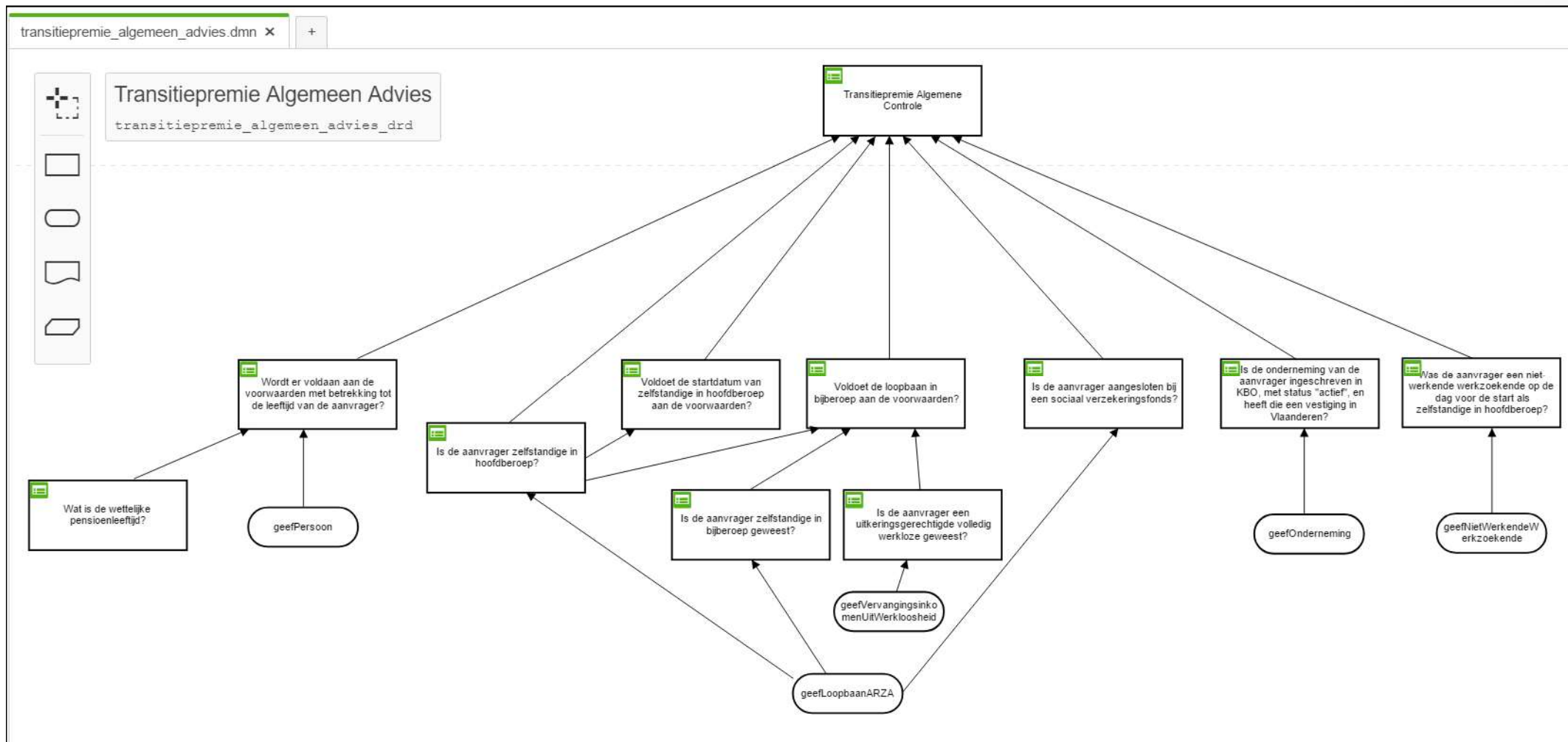
DRD

Decision Table

Dish				
U	Input +		Output +	Annotation
	Season	Vegetarian Guests	Dish	
1	"Fall"	false	"Spareribs"	-
2	"Winter"	false	"Roastbeef"	-
3	"Spring"	false	"Steak"	-
4	"Summer"	false	"Light Salad and a nice Steak"	Hey, why not!?
5	-	true	"Pasta"	-
+	-	-	-	-

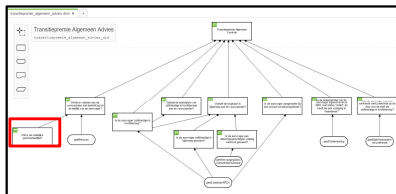
Example 'Do I qualify for a Transitie subsidy'

- With the transition premium for self-employed people, the Government of Flanders wants to bridge the gap between unemployment and entrepreneurship, by providing a support premium for a maximum of 24 months while starting their own business. After all, the philosophy of the transition premium is to grant a premium for the start-up of your own business at the moment the benefit is lost.



Example 'Do I qualify for a Transitie subsidy'

- The first DRD 'Wat is de wettelijke pensioenleeftijd '.



Wat is de wettelijke pensioenleeftijd?

wettelijke_pensioenleeftijd

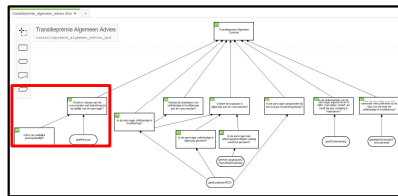
View DRD



U	Input +	Output +	Annotation
	Aanvraagdatum	Wettelijke pensioenleeftijd	
	feel-local-date-time	integer	
1	<=date and time("2024-12-31T00:00:00")	65	-
2	[date and time("2025-01-01T00:00:00")..date and time("2029-12-31T00:00:00")]	66	-
3	>=date and time("2030-01-01T00:00:00")	67	-
+	-	-	-

Example 'Do I qualify for a Transitie subsidy'

- The first DRD 'Wat is de wettelijke pensioenleeftijd '.



Result is
'wettelijke-pensioenleeftijd_result'



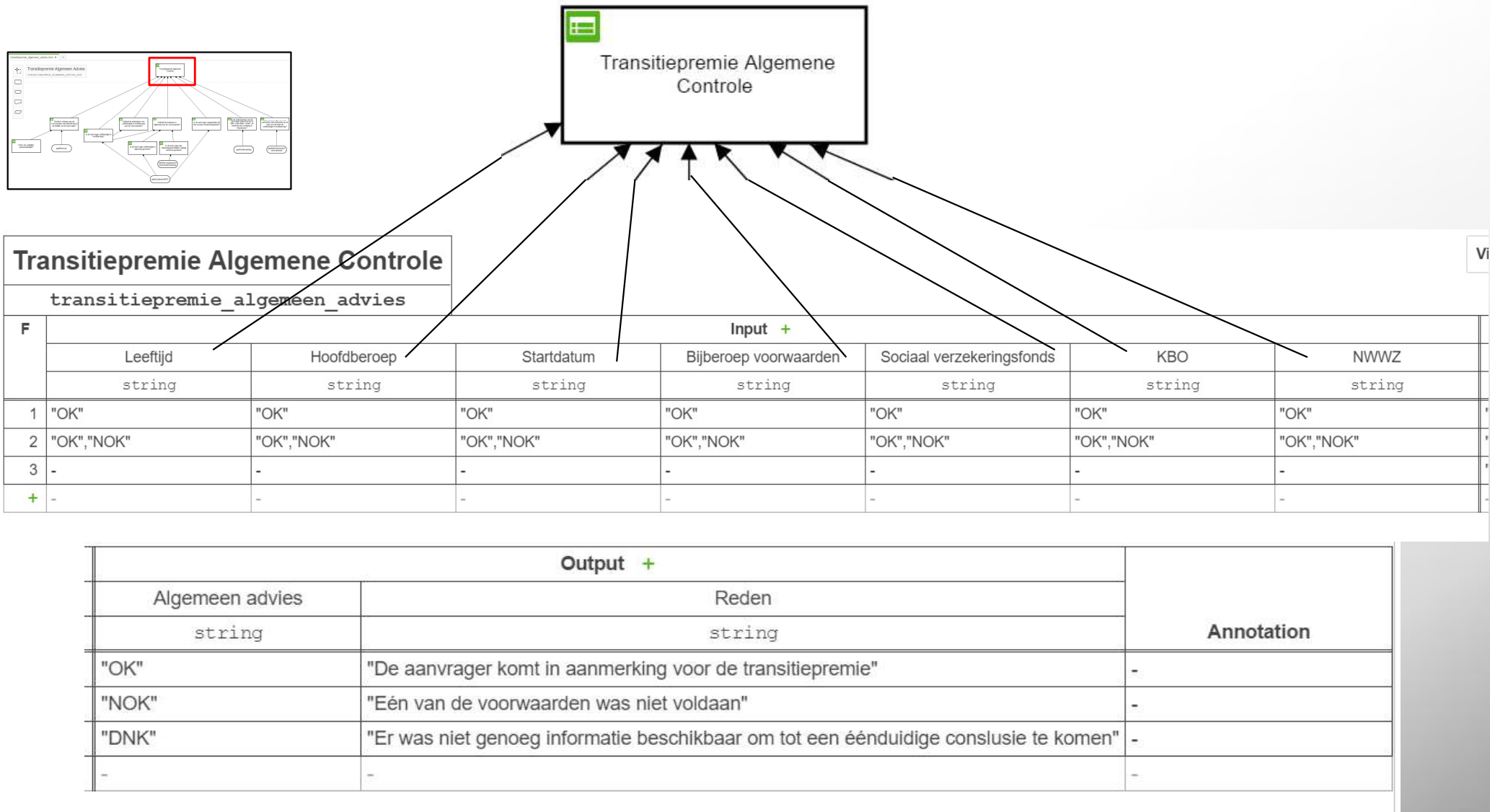
Wordt er voldaan aan de voorwaarden met betrekking tot de leeftijd

[View DRD](#)


leeftijd				
U	Input +	Output +		
	Leeftijd	Leeftijd ok?	Reden	Annotation
	double	string	string	
1	[45..wettelijke_pensioenleeftijd_result[	"OK"	"De aanvrager is minstens 45 jaar en heeft de pensioenleeftijd nog niet bereikt in de maand waarin hij als zelfstandige start"	-
2	]0..45[	"NOK"	"De aanvrager is jonger dan 45 jaar in de maand waarin hij als zelfstandige start"	-
3	>=wettelijke_pensioenleeftijd_result	"NOK"	"De aanvrager heeft de pensioenleeftijd bereikt in de maand waarin hij als zelfstandige start"	-
4	0	"DNK"	"De leeftijd van de aanvrager kon niet bepaald worden"	-
5	-	-	-	-
+	-	-	-	-

Example 'Do I qualify for a Transitie subsidy'

- The first DRD 'Wat is de wettelijke pensioenleeftijd '.



- The importance of the Lexicon
- The enterprise Human and Physical Actors
- How to define Actors in BPMN which can be reused in UML
- RASCI
- BPMN and UML frameworks
- BPMN – Conventions of styles / framework
- The 'Connection' of BPMN with UML in a layered structure

The Lexicon

- Agreed **standard** terminology
- Multi language (FR, NL)
- A **global** company Lexicon
- Agreed global terminology which can be used in the different departments of the company.
- Agreed global terminology which can be added to tasks, as one of the guidelines, for **outsourcing to suppliers**.



Lexicon

BPMN – Conventions of styles / framework

Examples: Lexicon



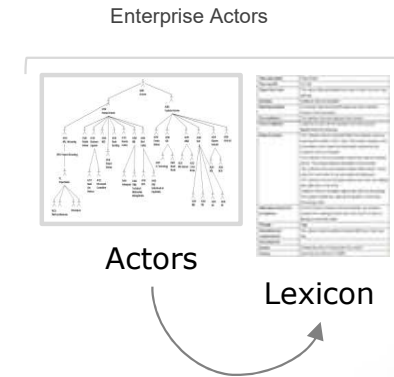
Lexicon

Afkorting	Afkorting voluit geschreven
AGIV	Agentschap voor Geografische Informatie Vlaanderen
VLM	Vlaamse Landmaatschappij
RVV	Recht van voorkoop: Vlaams voorkeepsrecht
EVA	Extern Verzelfstandigd Agentschap
IVA	Intern Verzelfstandigd Agentschap
BPMN	Business Process Modelling Notation
AAPD	Algemene Administratie van de Patiënten
BAM	Beheersmaatschappij Antwerpen Middelheim
CIW	Coördinatiecommissie Integraal Wonen
RWO	Ruimtelijke Ordening, Woonbeleid en Omgeving
ANB	Agentschap voor Natuur en Bos
OCMW	Openbaar Centrum voor Maatschappelijk Welzijn
VMM	Vlaamse Milieumaatschappij
VMSW	Vlaamse Maatschappij voor Sociaal Werk
VVP	Vereniging van de Vlaamse Provincies
VVSG	Vereniging van Vlaamse Steden en Gemeenten

Algemeen begrip	Beschrijving
Voorkoopsrecht	Recht om een perceel dat te koop wordt aangeboden, voor dezelfde prijs en onder dezelfde modaliteiten, bij voorrang op de kandidaat-koper aan te kopen. (Bron: Decreet houdende de harmonisering van de procedures van voorkeepsrechten, 25 mei 2007, gepubliceerd in het Belgisch Staatsblad van 24 juni 2007)
Vlaams voorkeepsrecht	Het Vlaams voorkeepsrecht is een voorkeepsrecht dat bij of in uitvoering van een wet of decreet is toegekend, met uitzondering van een op 30 juli 1993 bestaand recht van voorkoop dat bij of in uitvoering van een wet is toegekend. (Bron: Decreet houdende de harmonisering van de procedures van voorkeepsrechten, 25 mei 2007, gepubliceerd in het Belgisch Staatsblad van 24 juni 2007)
Soort Vlaams voorkeepsrecht	De soorten Vlaamse voorkeepsrechten zijn terug te leiden tot een bepaald decreet of regelgeving.
Type Vlaams voorkeepsrecht	De types Vlaamse voorkeepsrechten zijn de verschillende onderverdelingen van de soorten Vlaamse voorkeepsrechten.
Agentschap voor Geografische Informatie Vlaanderen (AGIV)	Het Agentschap voor Geografische Informatie Vlaanderen is een agentschap opgericht bij decreet van 7 mei 2004 houdende de oprichting van het Agentschap voor Geografische Informatie Vlaanderen.

What is an Actor / Role ?

- An actor is presented by a 
- An actor is one of the **stakeholders**.
- An actor is described in the **Lexicon**.
- An actor acts as an **enterprise actor**.
- An actor is **someone or something** that Interacts with the system.
- The actor is a type (a class), not an instance.
- Actors represent **roles**, not an individual user of the system, played by human users, hardware or other.
- Actors can be **ranked**. A primary actor is one that uses the primary functions of the system. A secondary actor is one that uses secondary functions of the system, those functions that maintain the system, such as managing data bases, communication, backups, and other administration tasks.



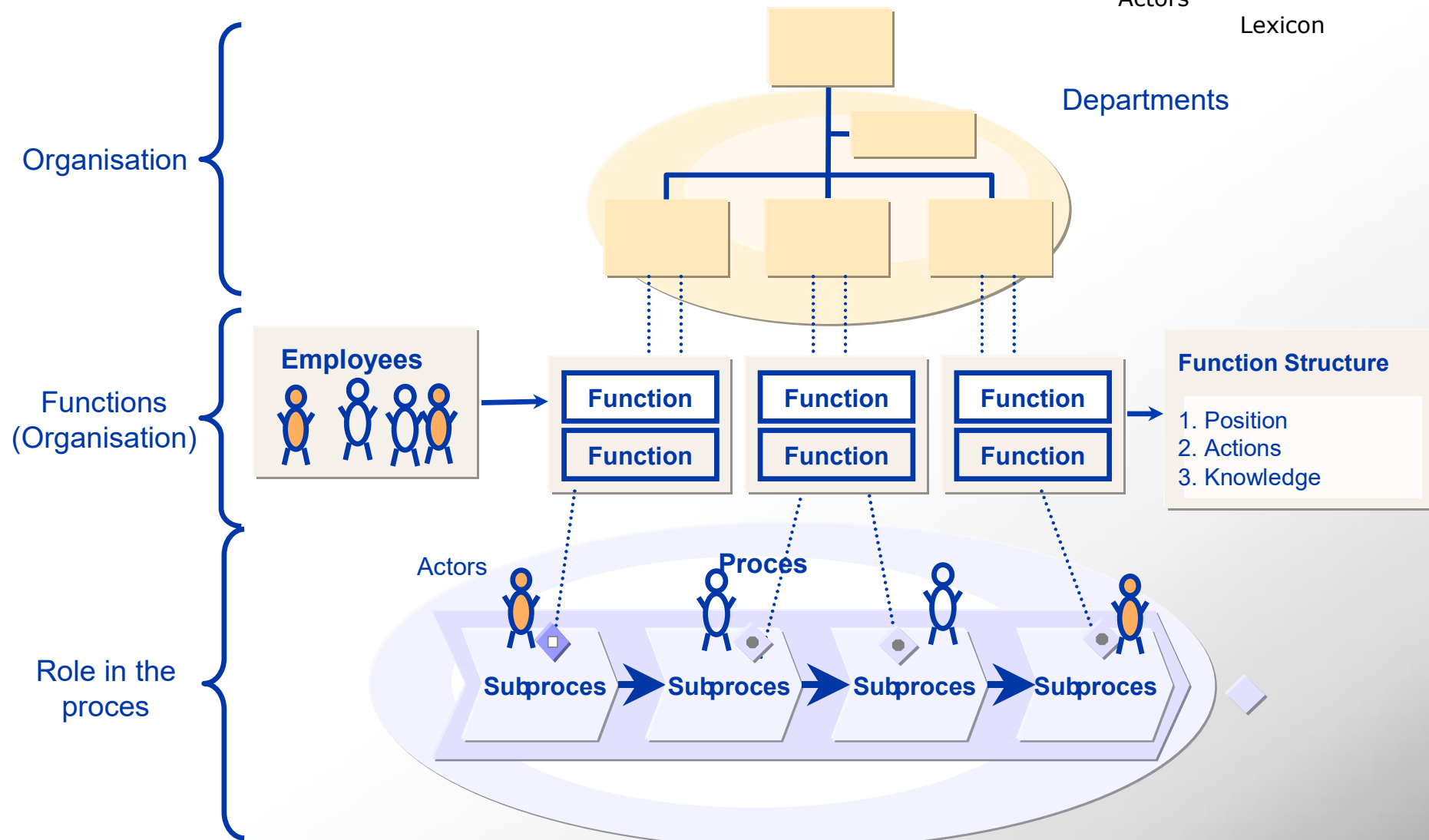
BPMN – Conventions of styles / framework

Example: Actors

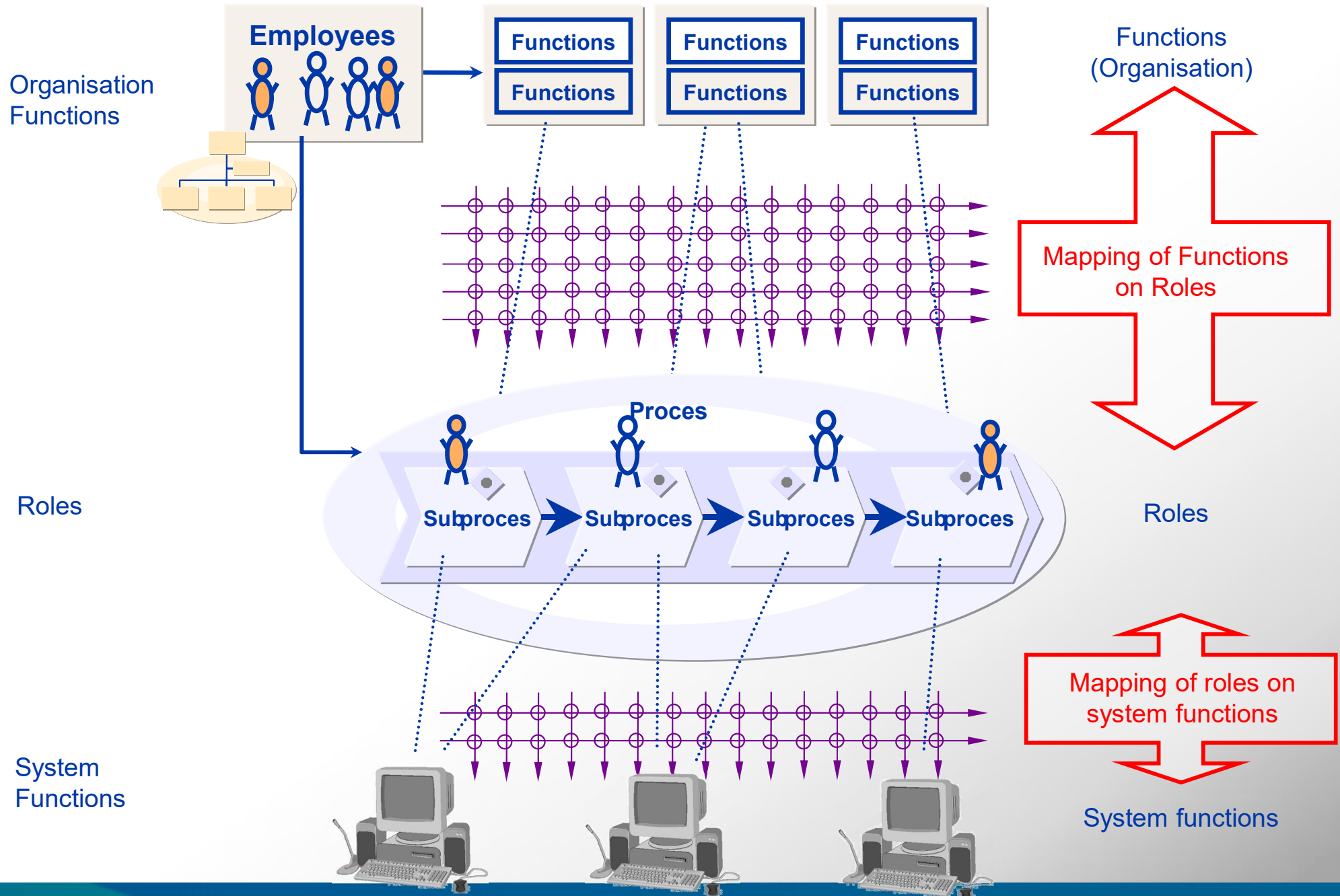
Ref.	Actor	Beschrijving
A1000	Actoren	Een actor is een gebruiker van een applicatie die activiteiten, beschreven in een 'use case diagram' onderneemt en voert dus een 'use case' uit om een specifiek doel te bereiken. Die actor is een abstractie van iets dat zich buiten een applicatie bevindt, maar met die applicatie interageert. Bovendien is een actor niet per definitie menselijk. (Bron: Pragmatisch modelleren met UML 2.0, Sander Hoogendoorn, september 2006)
A1100	Instrumenterend ambtenaar	Dit is de verzameling van het notariaat, de aankoopcomités, de burgemeesters en gouverneurs en de diplomatieke en consulaire agenten.
A1101	Koninklijke Federatie van het Belgisch Notariaat	De Koninklijke Federatie van het Belgisch Notariaat heeft als rol de beroepsvereniging te zijn van het notariaat en treedt ook op als studiedienst. De Federatie staat dus ten dienste van het notariaat, o.a. door de notariskantoren advies te verlenen bij juridisch complexe problemen en allerlei databanken ter beschikking te stellen die de notaris en zijn medewerkers kunnen consulteren tijdens de voorbereiding en redactie van de akten. (Bron: www.notaris.be)
A1101a	Notariaat	Dit is de verzameling van de notarissen en hun medewerkers.
A1101a1	Notaris	Een notaris, benoemd door de Koning, is een openbare ambtenaar, aangesteld om alle akten en contracten te verlijden waaraan partijen de authenticiteit van overheidsakten moeten of willen doen verlenen, de dagtekening ervan te verzekeren, ze in bewaring te houden en er grossen en uitgiften van af te geven. (Bron: Wet tot regeling van het notarisambt, 16 maart 1803) Hun bevoegdheid wordt vastgelegd in de Wet tot regeling van het notarisambt, 16 maart 1803.
A1101a2	Medewerkers	De medewerkers van de notarissen.
A1101b	e-notariaat	Het e-notariaat is een portaalsite dat in september 2000 werd gelanceerd om de globale dienstverlening van het notariaat verder te optimaliseren. Hiermee staat de Koninklijke Federatie van het Belgisch Notariaat de notarissen en hun medewerkers bij in de dagelijkse dienstverlening aan hun cliënten, door optimaal gebruik te maken van de vele voordelen die de nieuwe informatie- en communicatietechnologieën bieden. (Bron: www.notaris.be)

What is a (Business) Actor?

- Business Actors can be derived from Function in the organization / departments



What is a (Business) Actor?



Example of (Organisation Function) Actors

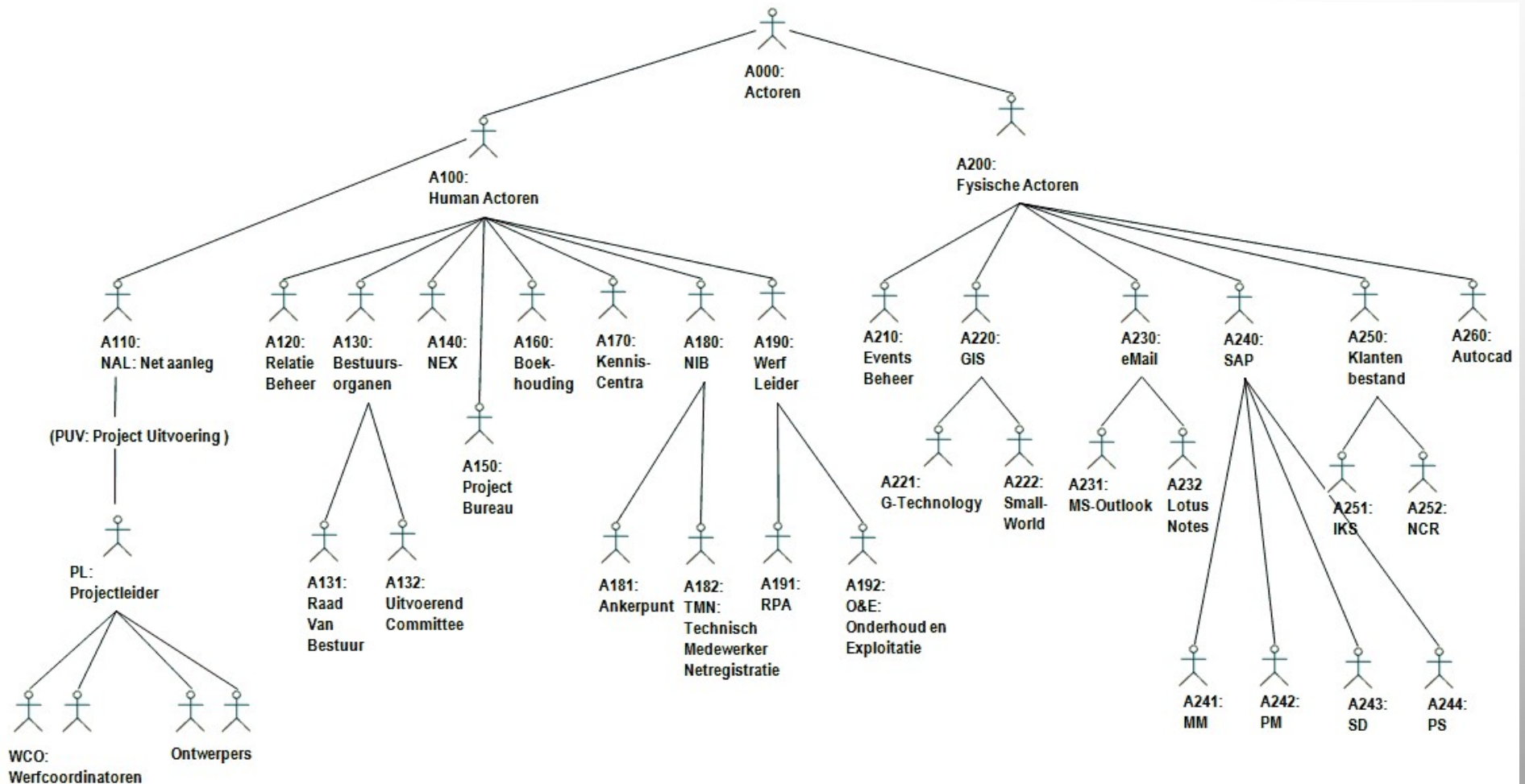
- Actors can be ranked (example numbers Axxx) in **Human** and **Physical** actors.
- Actors (Human and Physical) can be ranked by **Department / Team**.

Enterprise Actors



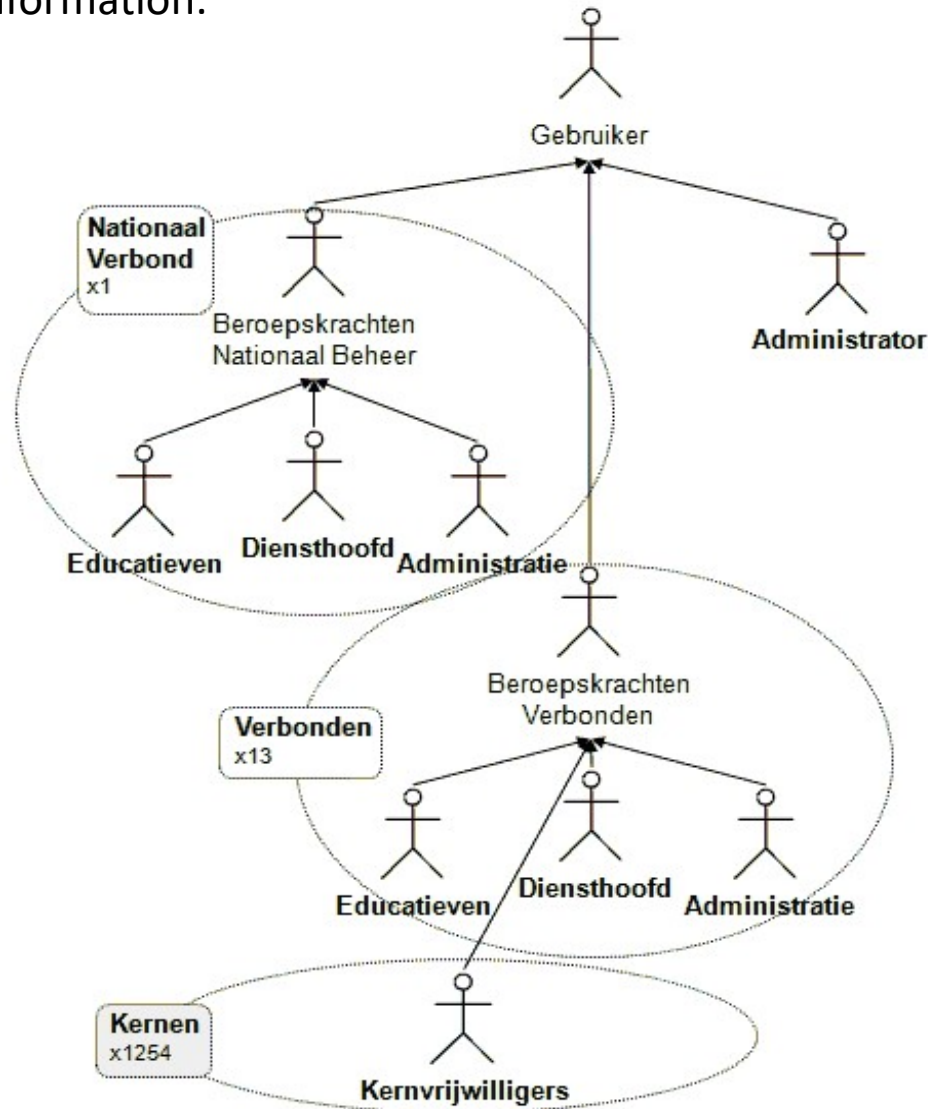
Actors

Lexicon



Example of (Organisation Function) Actors

- Actors can hide **Company Structure** and information.



Enterprise Actors



Actors

Lexicon

Example of (Roles) Actors

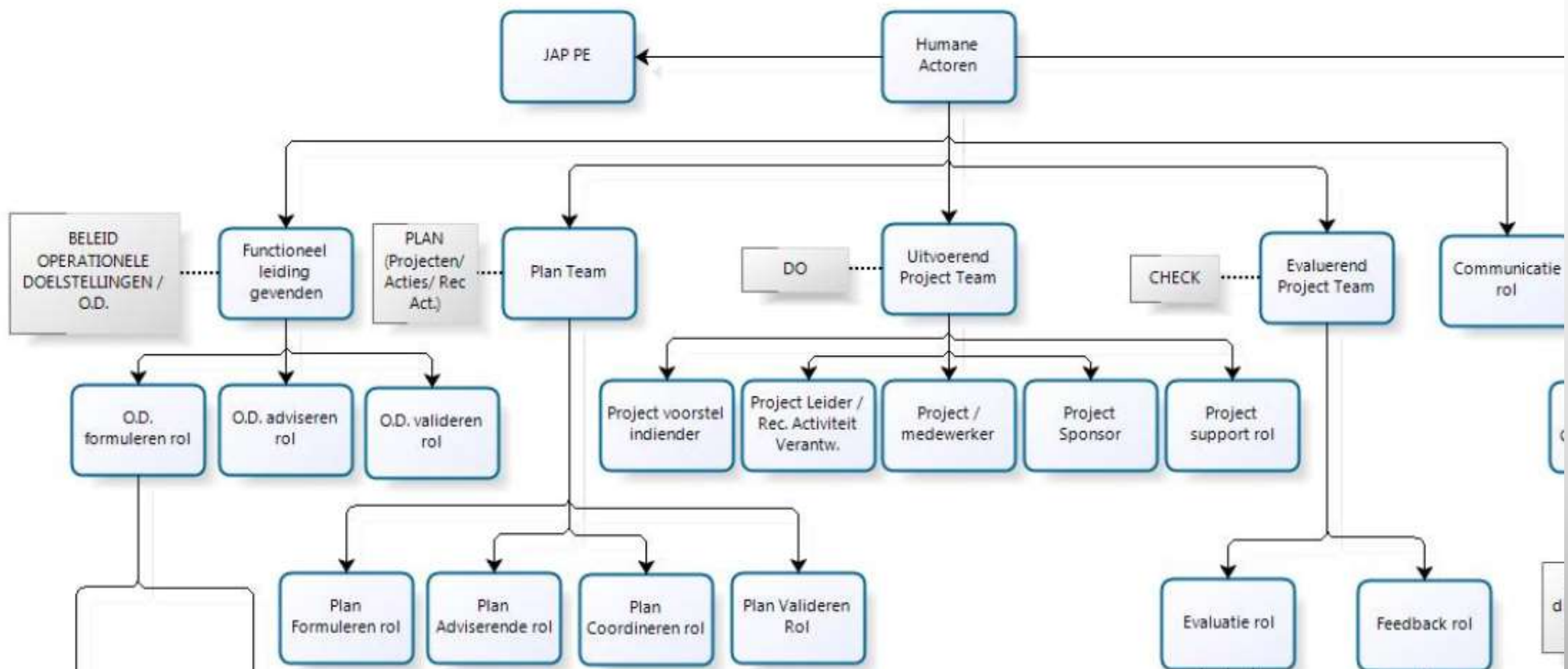
- Actors can hide **Company Structure** and information.

Enterprise Actors



Actors

Lexicon



Example of (Roles) Actors

- Actors can hide **Company Structure** and information.



Enterprise Actors



Actors

Lexicon

Human Actors RFS	Business Domain	Department	Role
Internal	Enterprise Management	Board	Director
			Board Member
		Supervisory Board (RVC)	RVC Board Member
		HRM	HRM Employee
		Legal & Compliance	Enterprise Lawyer
		PR	PR Employee
		Controlling	Controller
	Company Management	Board	Director
			Board Member
		HRM	HRM Employee
		Legal & Compliance	Company Lawyer
			Compliance Officer
		PR	PR Employee
		Controlling	Controller
		Business Information Management	
	Marketing	Campaign Management	
		Editorial team	
		DTP	
		Styling	
		Internet Marketing	Online Shop Employee
			Online Shop Representative
		E-Commerce	
		Marketing Intelligence	

What is an Actor?

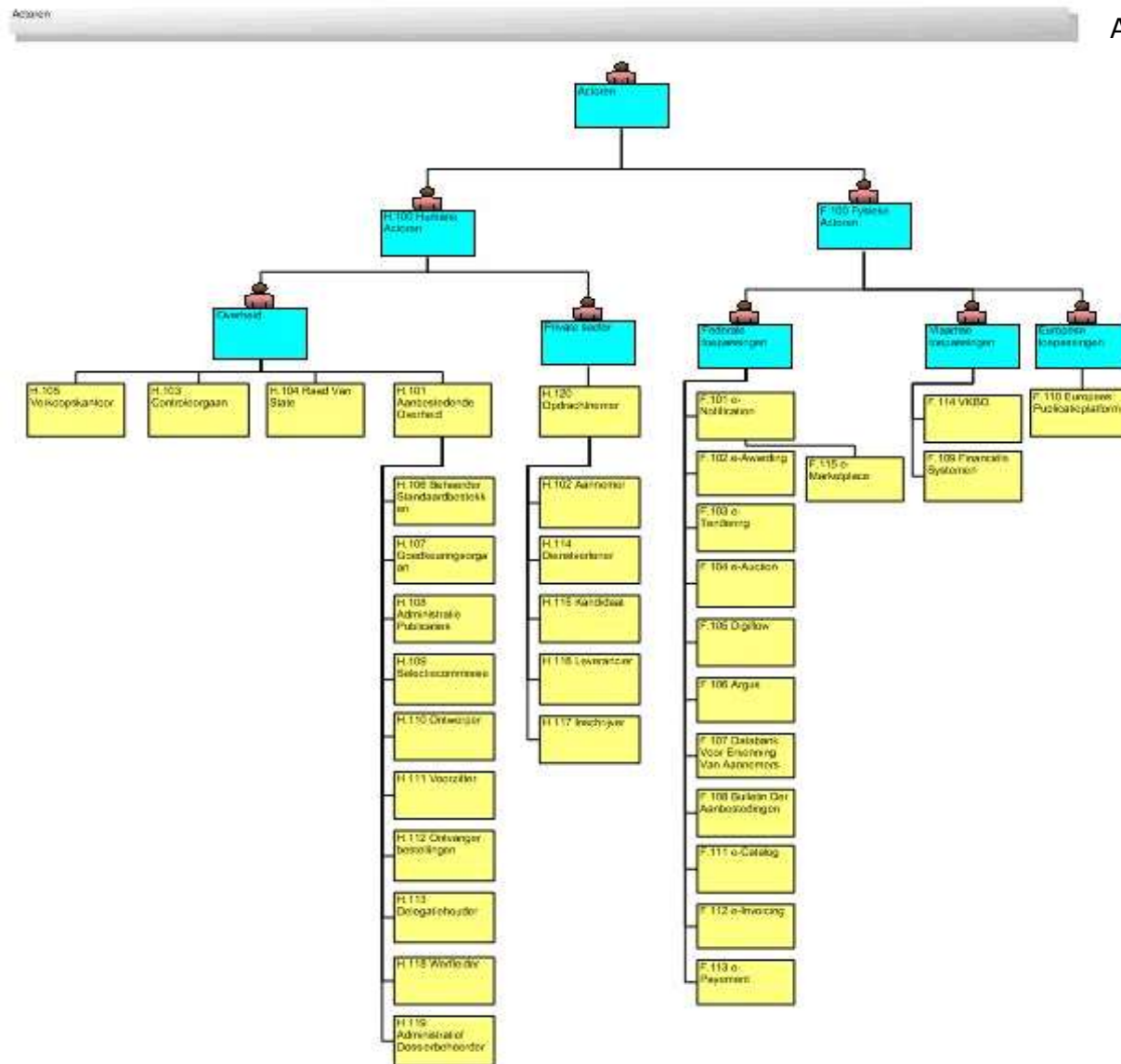
- Actors are being generated by the BPM tool.

Enterprise Actors



Actors

Lexicon

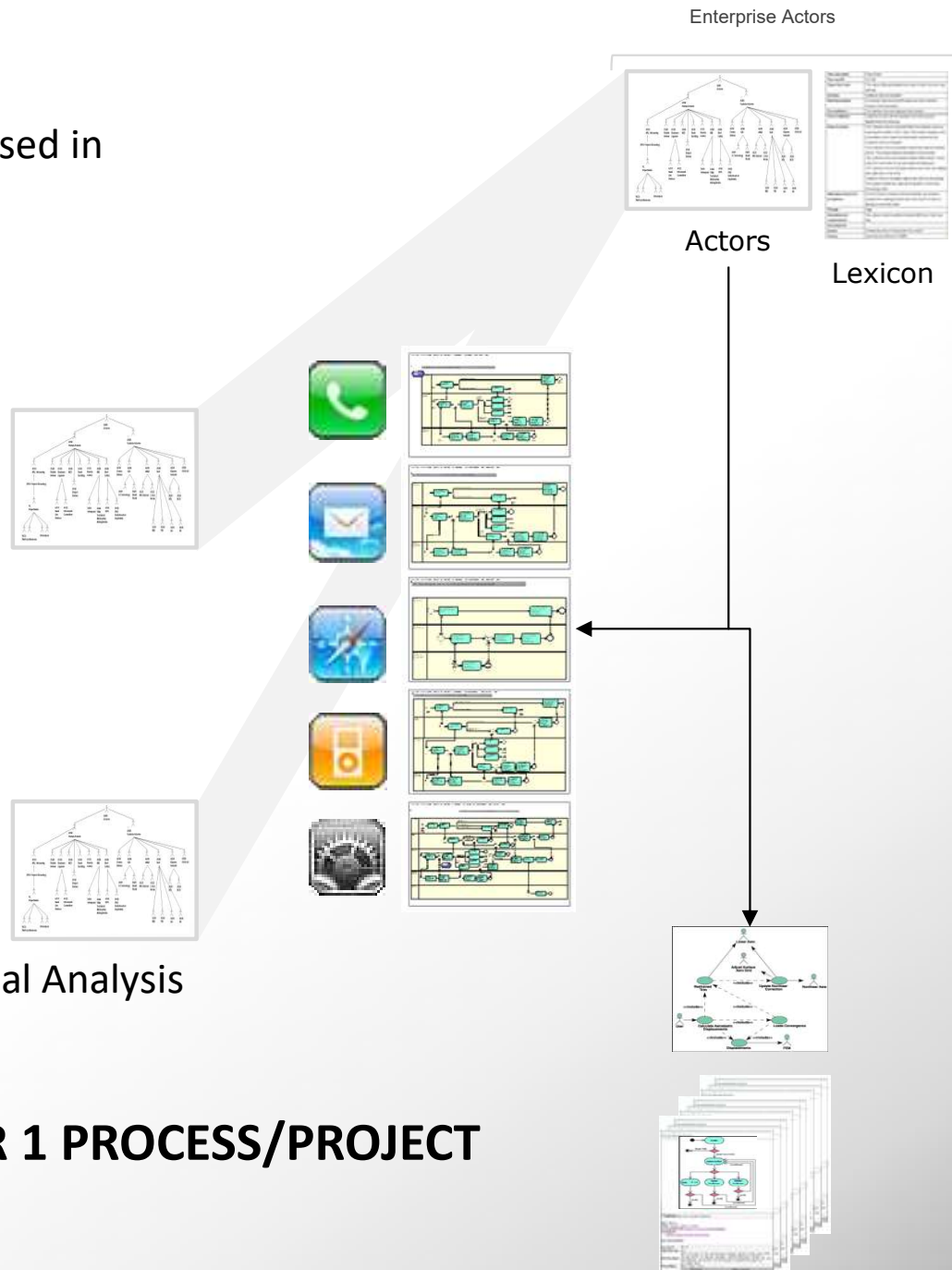


Re-use of an Actor?

- Enterprise Actors are used in

- BPMN for Business Analysis

- UML for Functional Analysis



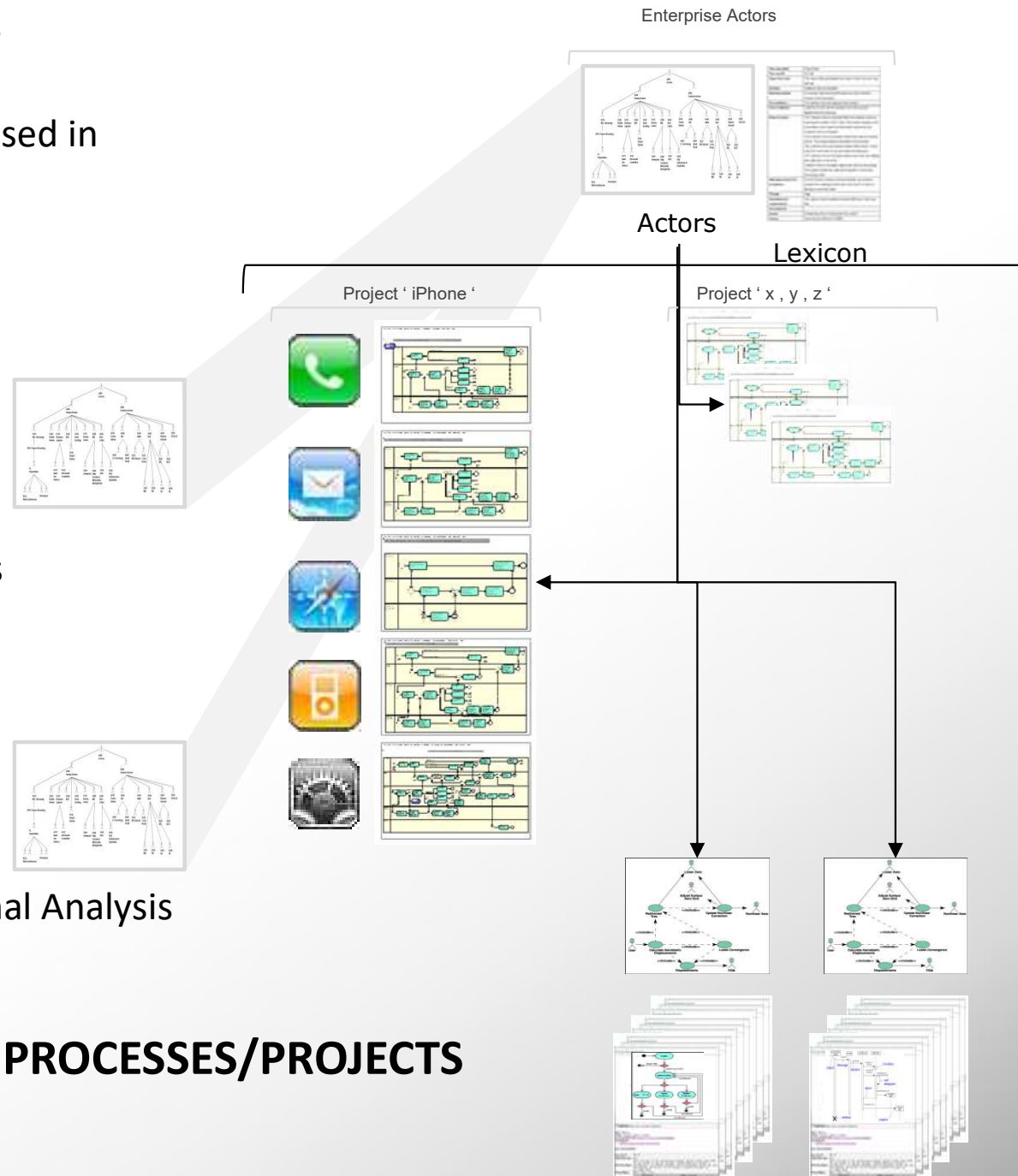
AND NOT ONLY FOR 1 PROCESS/PROJECT

Re-use of an Actor?

- Enterprise Actors are used in

- BPMN for Business Analysis

- UML for Functional Analysis

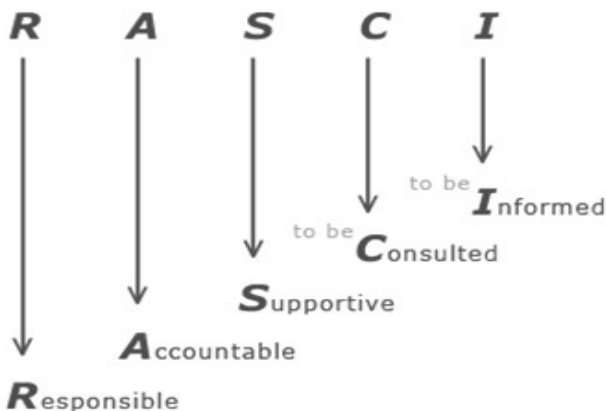


BUT FOR MULTIPLY PROCESSES/PROJECTS

Mapping of Functions on Roles

RASCI / RACI

The RASCI method is based on the principle that there are no more than **5 kind of relations towards an activity within an organisation**. The model is used to give a clear insight in the relations of functionaries within the organisation with respect to the activities of an organizational procedure.



Hou het eenvoudig

Effectief communiceren in organisaties

Auteur: Arie Quik

Uitgever: Addison Wesley Longman

Paperback, 93 blz.

ISBN 90-6789-681-0



Fasen	Activiteiten	Stakeholders						
		Afdelings hoofd Coex	Stafmede werker Coex	(Afdeling hoofd) Exploitati e Entiteit	Busines s Architec t	PM	Business Analyst	Exploitant
Fase 1 : Vision and Setup	Review en verwerking planning en deliverables	C	S		I	A	R	C
Fase 2: Design AS-IS Beschrijving	Voorbereiding workshop						R/A	
	Workshop met Coex		S				R/A	
	Verwerking Coex workshop BPMN en informatie flow						R/A	
	Workshop met entiteit Vlaams Brabant			S			R/A	
	Verwerking workshop entiteit Vlaams Brabant BPMN, informatiefLOW, beschrijving proces en rollen						R/A	
	Project overlegmoment		S		S	A	R	
	Voorbereiding WS AS IS		C				R/A	
	Workshop met entiteiten AS IS		S	S			R/A	
	Verwerking workshop en documentatie BPMN 3.1 tem 3.3 en APL		C	A	I	I	R	
	Voorbereiding workshop voor VAV, leerlingenvervoer & bijzonder vervoer		C				R/A	
Fase 3: Design AS-IS Evaluatie	Project Milestone moment (AS IS validatie)	A	S		S	S	R	
	Verzoek validatie (correctheid & volledigheid) & prioritering vd aandachtspuntenlijst via email		I	A			R	
Fase 4: Design – TO-BE ontwikkeling en evaluatie	Verwerking feedback		C				R/A	
	Facilitering workshop brainstorming ideeën en quick wins		S	S			R/A	
	Voorbereiding WS TO BE		C				R/A	
	Facilitering workshops TO BE: Oplossingen (en eventueel Quick Win's) evalueren samen met alle entiteiten en Coex		S	S			R/A	
	Verwerking WS TO BE		C	A	I	I	R	
	Faciliteren workshop metingen proces		S	C			R/A	
	Verwerking en validatie workshop (metingen)	I	A	I			R	
	WS's VAV, leerlingenvervoer en bijz. Vervoer		S	S			R/A	
	Verwerking WS		C	A			R	
	Faciliteren workshop specifiek voor Exploitanten		S			S	R	S
	Verwerking	I	A			I	R	I
	WS informatiestroom & classdiagram & identifying business rules met entiteiten en Coex		S	S	C		R/A	
	Verwerking		C	C			R/A	
	WS informatiestroom & classdiagram & business rules: validatie met coex en ICT		S		A	I	R	
	Project overleg moment		S		S	A	R	
Fase 5: Validatie	Bijwerken Business analyse document		C	C	C		R/A	
	Project Milestone moment: oplevering	A	S	I	S	S	R	I

RASCI / RACI

R – Responsible / P (rime responsible)

Wie is verantwoordelijk voor het uitvoeren van de activiteit? Degene die verantwoordelijk is voor het proces en/of het resultaat, de proces-eigenaar. Deze geeft o.a. het resultaat voor gebruik vrij.

A – Accountable

Aan wie moet verantwoording afgelegd worden? Degene die de proces-eigenaar ter verantwoording kan roepen over het resultaat. De proces-eigenaar legt dus rekening en verantwoording af over het resultaat aan degene die accountable is, dit is niet per sé de hiërarchische leidinggevende.

S – Supportive (optional)

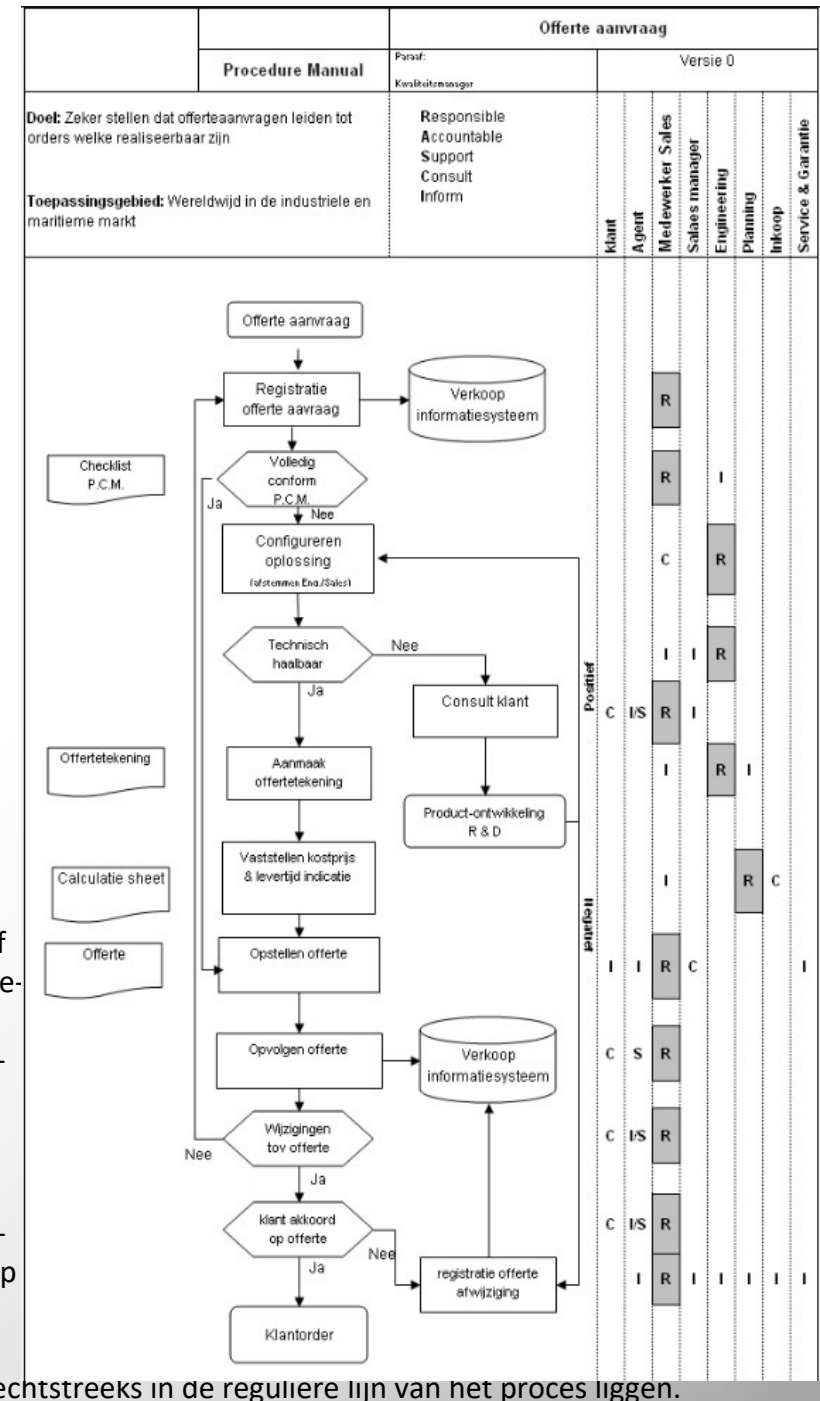
Wie kan support geven? Degene die produceert, die de proceseigenaar helpt bij de totstandkoming van het resultaat. Kernvragen hierbij zijn: wie produceert en met welke middelen.

C – Consulted

Wie moet geraadpleegd worden? Degene die geraadpleegd wordt vooraf en daarmee het resultaat kan beïnvloeden. Consulted is in de Engelse betekenis: wie het resultaat controleert of beoordeelt. Hiermee wordt aangeduid degene die checkt of het resultaat voldoet aan gestelde kwaliteitscriteria.

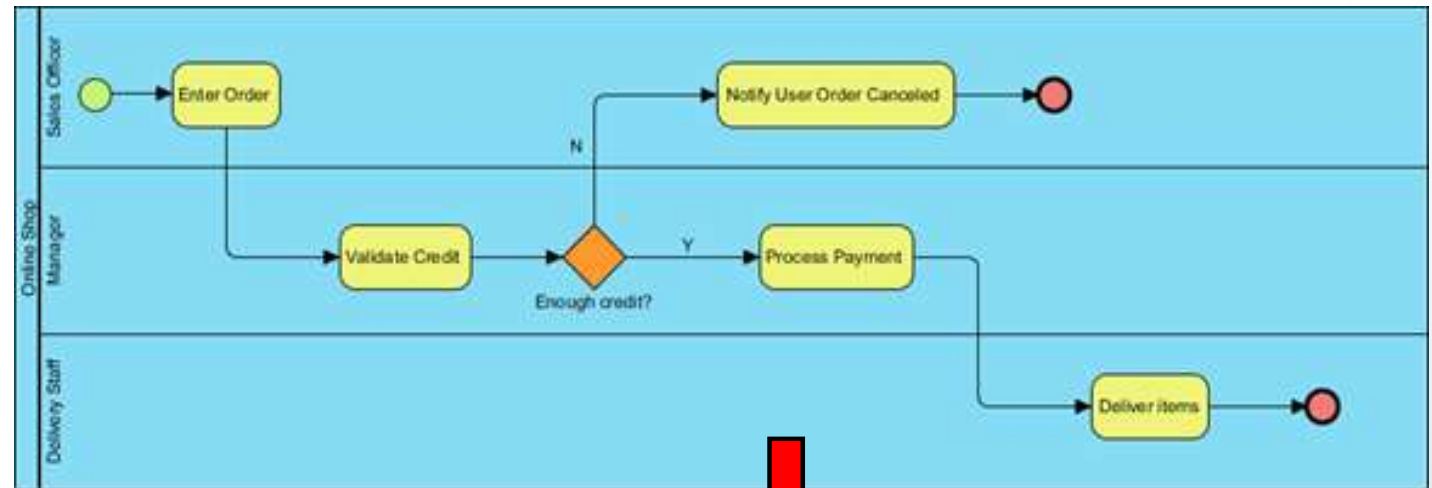
I – Informed

Wie moet geïnformeerd worden? Degene die geïnformeerd wordt achteraf en kan daardoor het resultaat dus niet meer beïnvloeden. Wie moet op basis van het resultaat geïnformeerd worden (wie gebruikt deze informatie bij zijn eigen taken). Wie moet er iets doen? Wie moet er op basis van het resultaat handelen? De kern is het informeren van anderen die niet rechtstreeks in de reguliere lijn van het proces liggen.



RASCI / RACI

Generate RA(S)CI from BPMN



(5) Task, Sub-Pr...

	Deliver items	Notify User Order Canceled	Process Payment	Validate Credit	Enter Order
Online Shop					
Delivery Staff	R				
Manager			R	R	A
Sales Officer	I	R			R

(4) Po...

	Deliver items	Notify User Order Canceled	Process Payment	Validate Credit	Enter Order
Online Shop					
Delivery Staff	R				
Manager			R	R	A
Sales Officer					

Legend:

- (None)
- R: Responsible
- A: Accountable
- C: Consulted
- I: Informed
- Configure...

Online Shop RACI Diagram

filter column... filter row... Filter code...

(5) Task, Sub-Pr...

	Deliver items	Notify User Order Canceled	Process Payment	Validate Credit	Enter Order
Online Shop					
Delivery Staff	R				
Manager			R	R	
Sales Officer		R			R

Mapping of roles on system functions

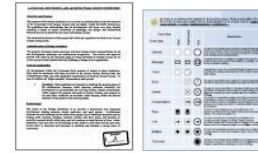
CRUD / Create, Read, Update and Delete

- In computer programming, Create, Read, Update and Delete (CRUD) are the four basic functions of persistent storage.
- CRUD is expanded with the words retrieve instead of read or destroy instead of delete.
- CRUD is also used to describe user interface conventions that facilitate viewing, searching, and changing information.

Frameworks

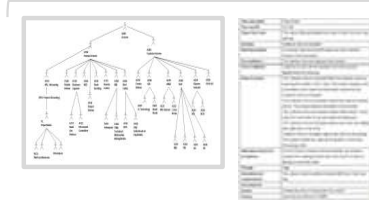
- BPMN Frameworks = Business Analysis Framework
 - BPMN Syntax (this course)
 - BPMN Conventions

Guidelines BA Framework



BPMN Syntax

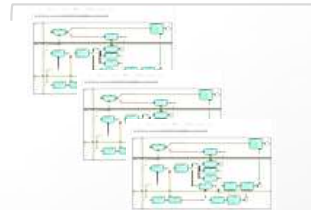
Enterprise Actors



Project ' iPhone '



Project ' x , y , z '



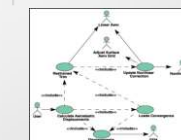
- UML Frameworks = Functional Analysis Framework
 - UML Syntax
 - UML Conventions

Guidelines FA Framework

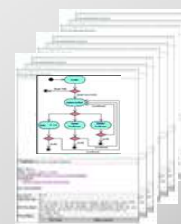
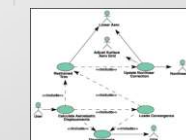


UML Syntax

SubProject ' iPhone ' A

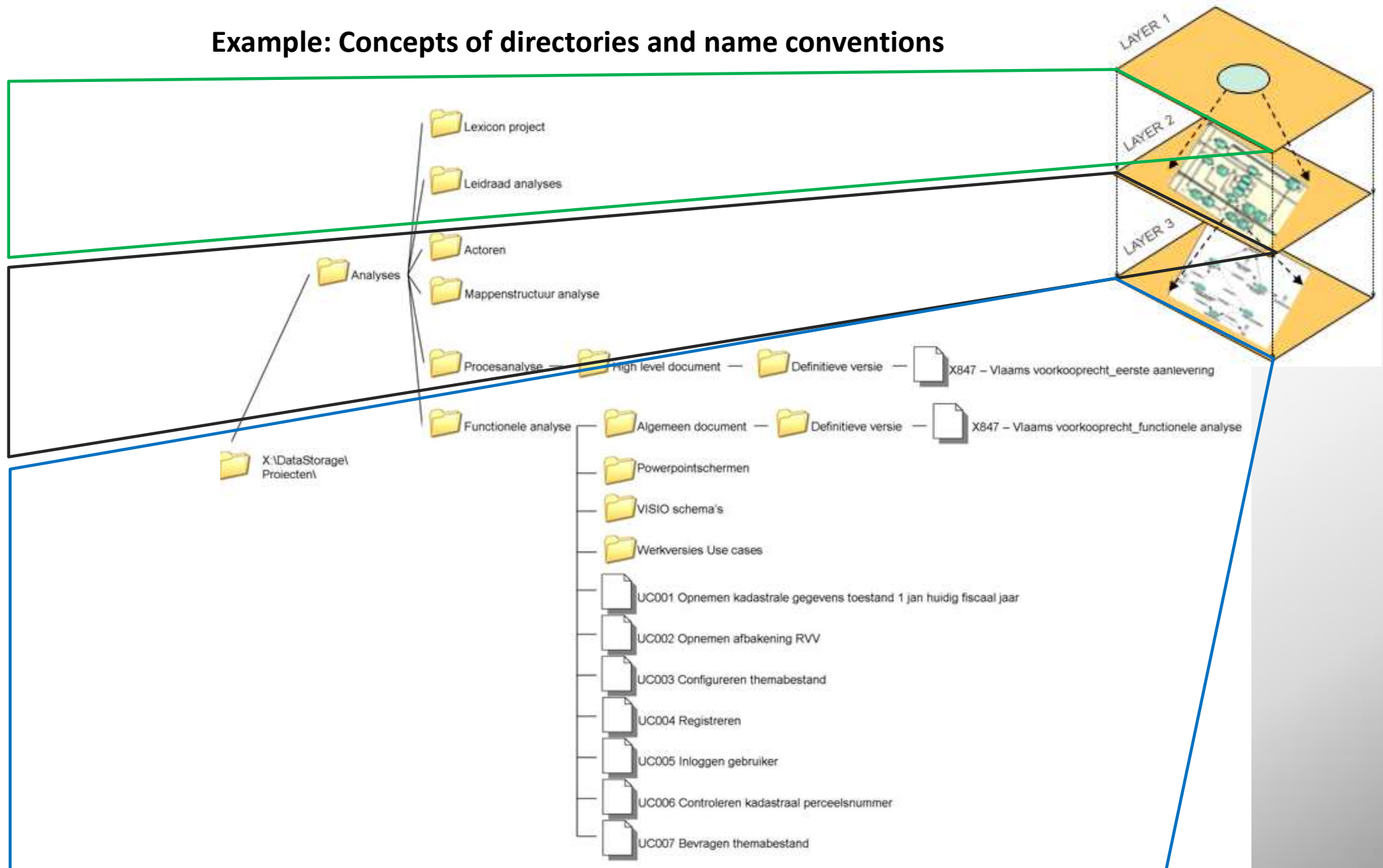


SubProject ' iPhone ' B



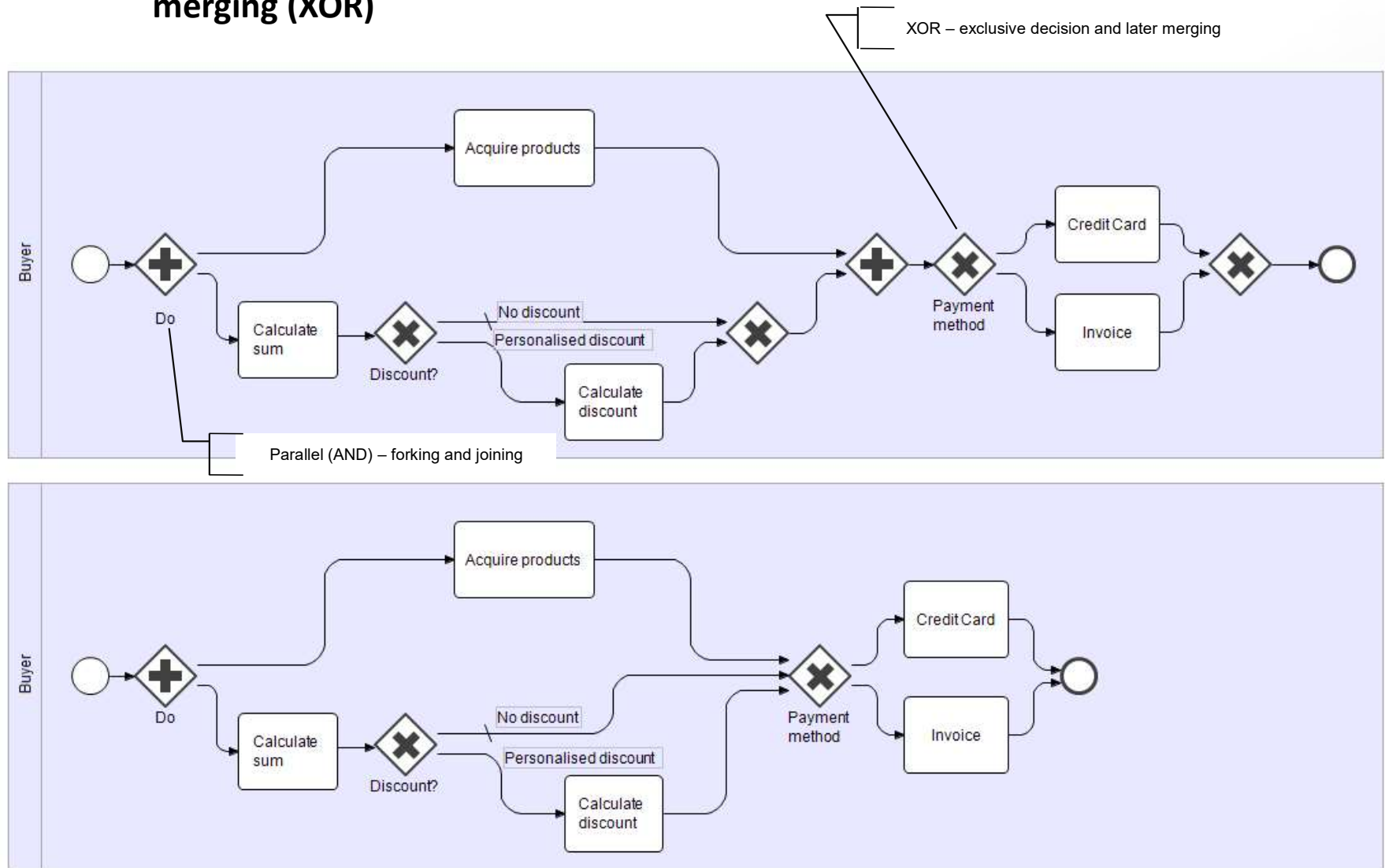
BPMN – Conventions of styles / framework

Example: Concepts of directories and name conventions



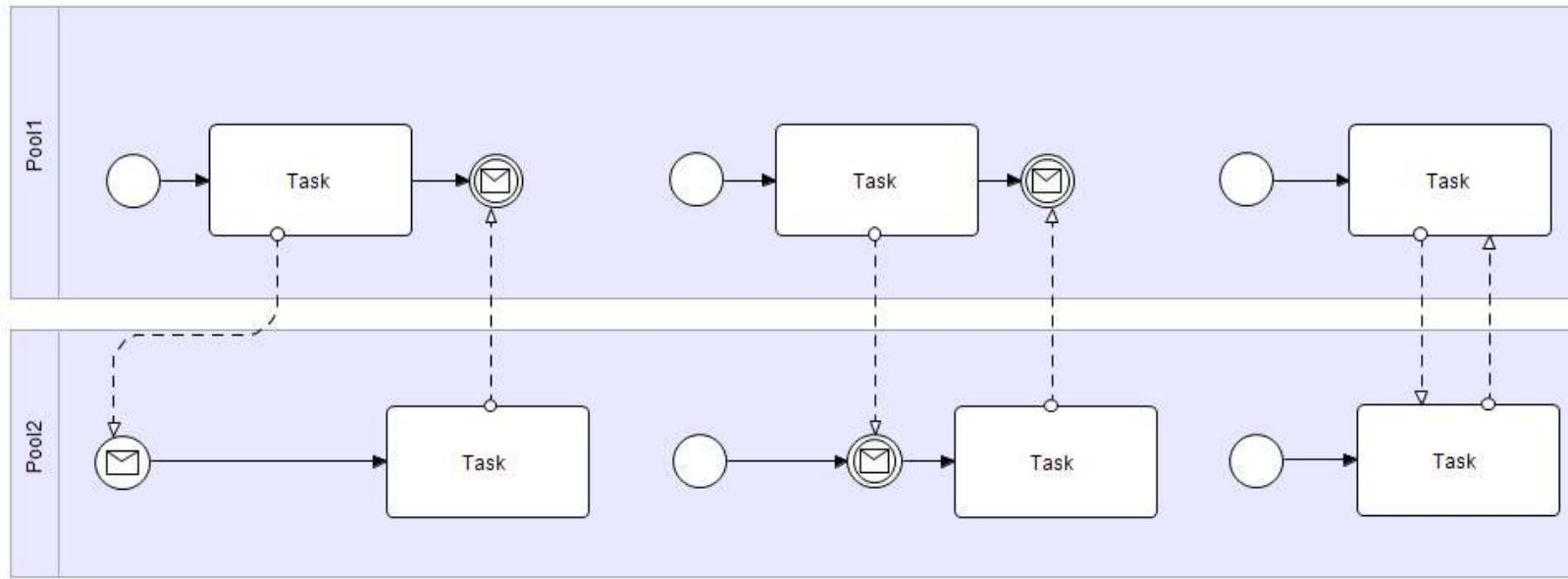
BPMN – Conventions of styles / framework

Example: Concepts of forking (AND), joining (AND), exclusive (XOR) and merging (XOR)

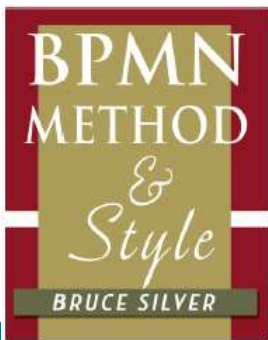


BPMN – Conventions of styles / framework

Example: Sort of message notations



http://en.bpmn-community.org/best_practices/13/

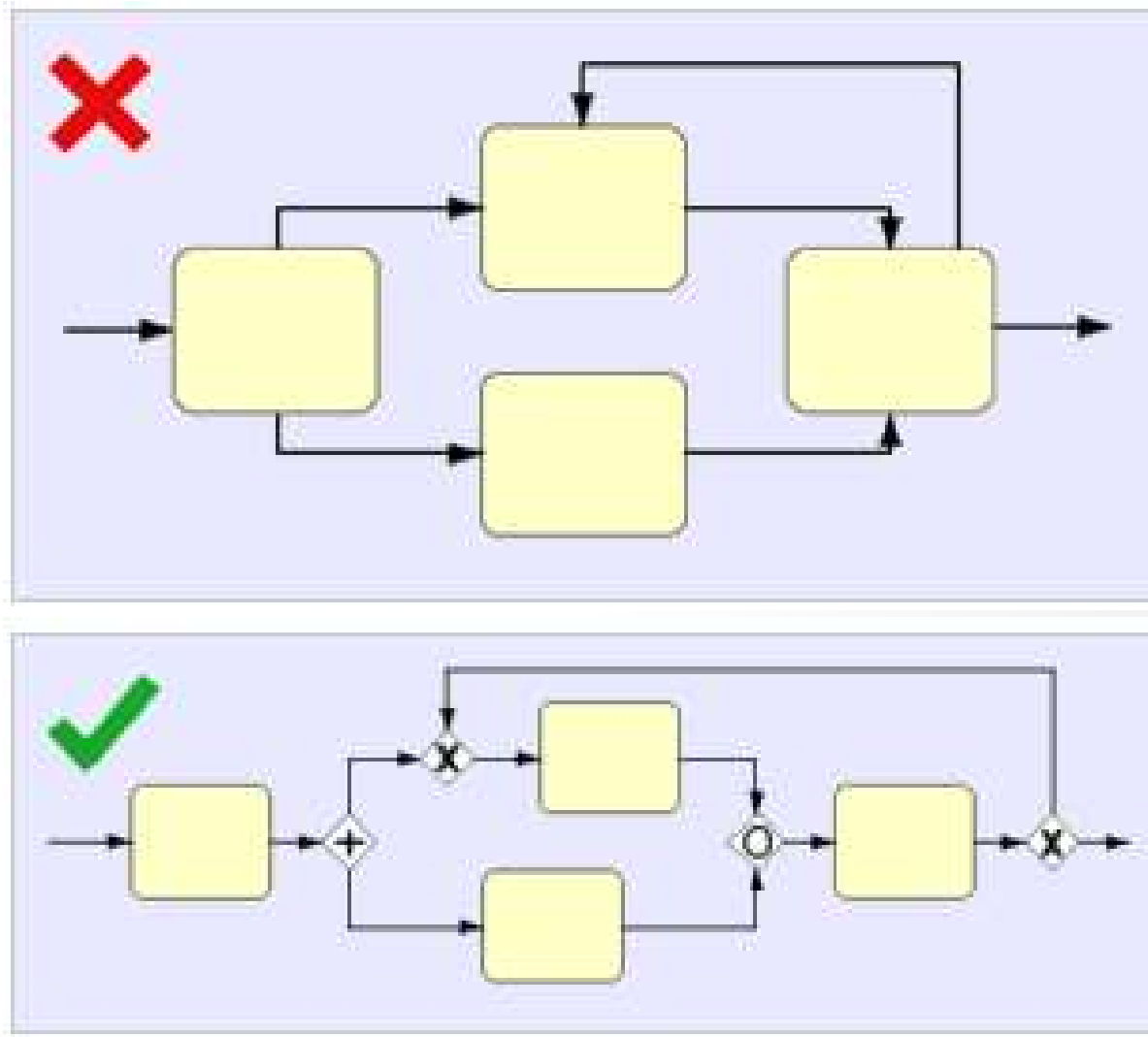


Amazon.com

<http://www.amazon.com/exec/obidos/ASIN/0982368100>

BPMN – Conventions of styles / framework

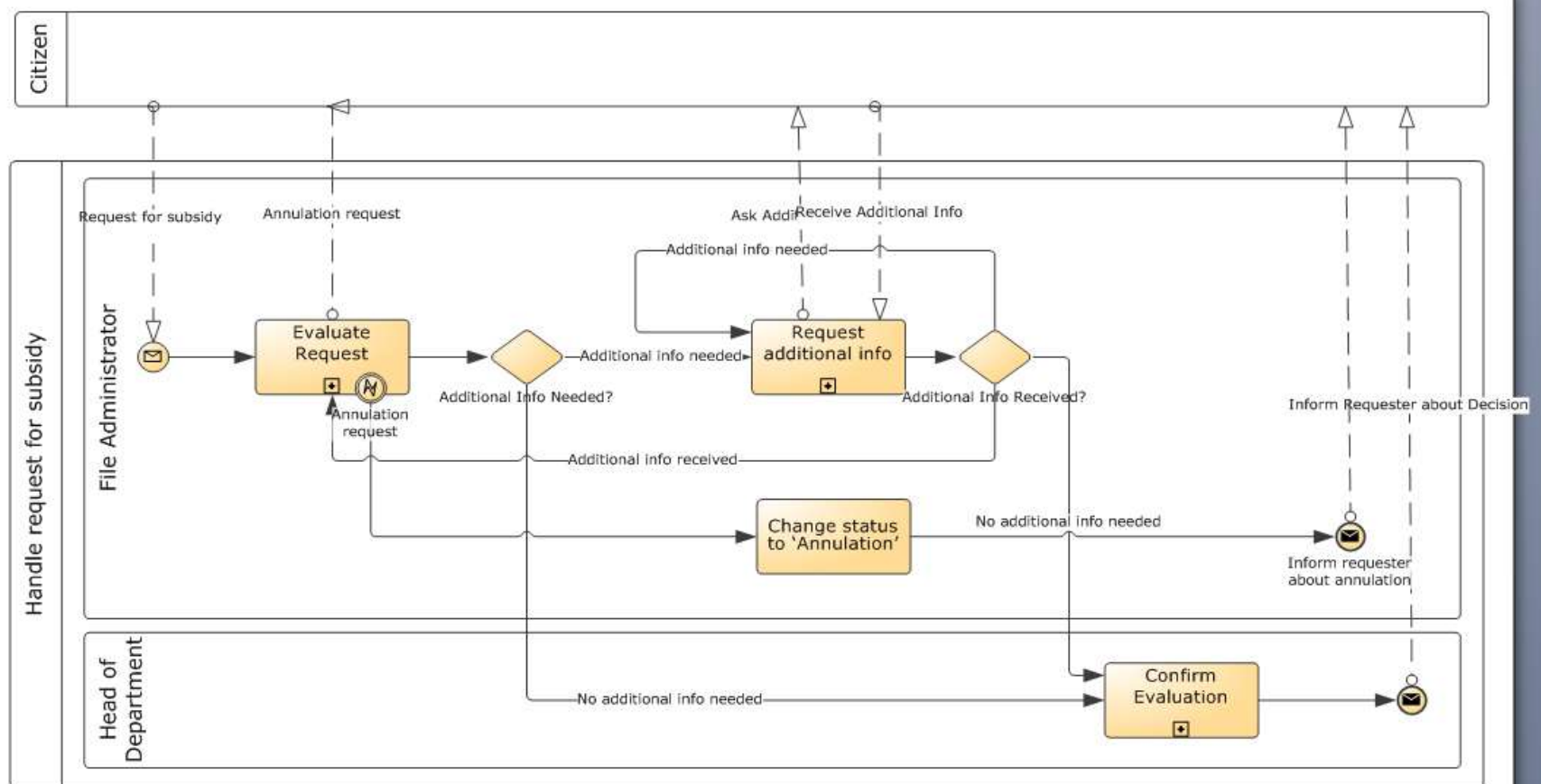
Example: xxx



BPMN – Conventions of styles / framework

Example: Executable modeling -> define P.O.C.

BPMN model - 'Behandelen Aanvraag'



BPMN – Conventions of styles / framework

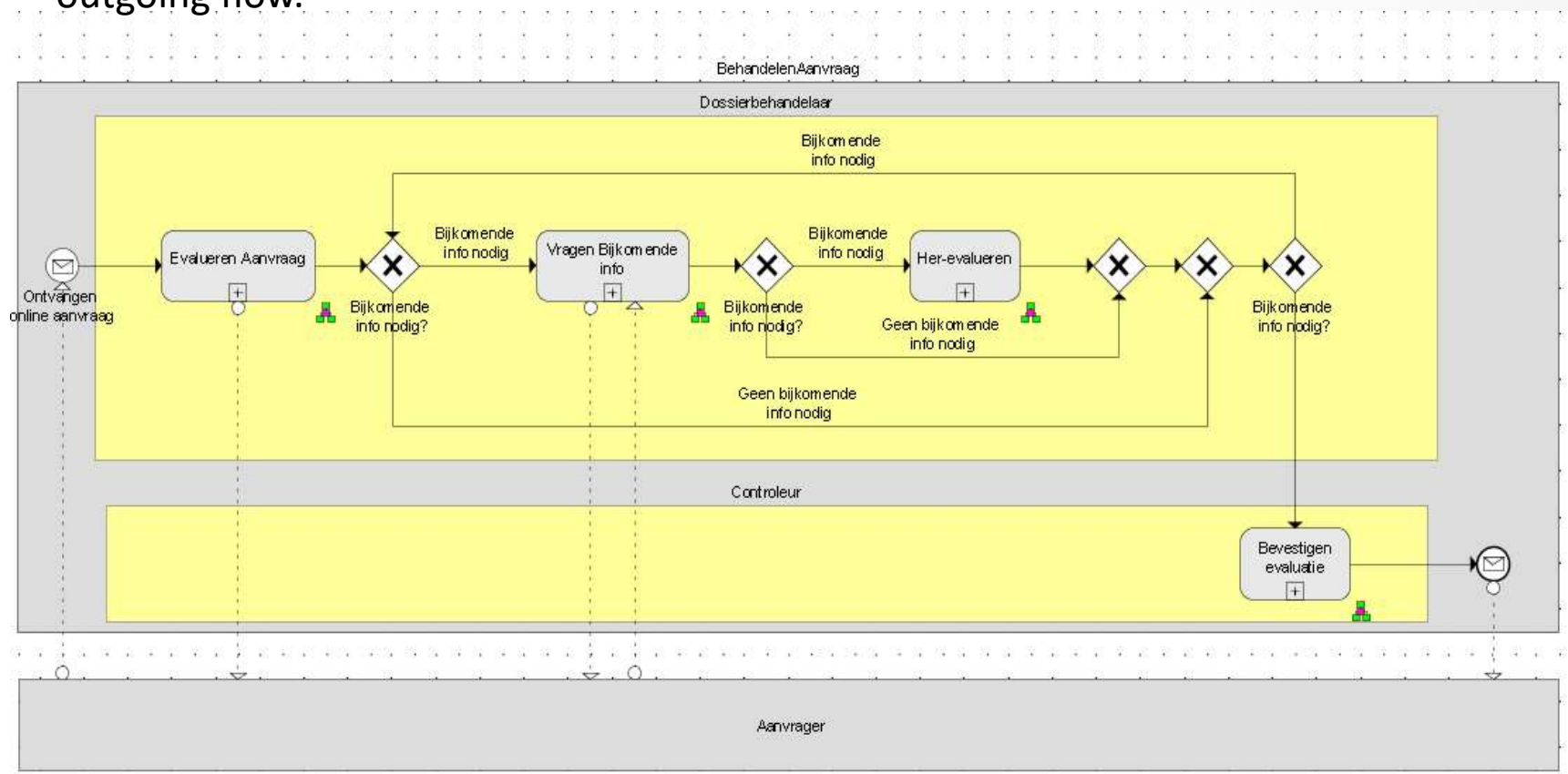
Example: Executable modeling -> define P.O.C.

BPMN model - 'Behandelen Aanvraag'

-> ORACLE BPEL has problems with interpretation of cycles.

ORACLE
Oracle Business Process Analysis Suite

-> In Oracle BPA Suite every activity may have only 1 incoming and 1 outgoing flow.



Framework responsible

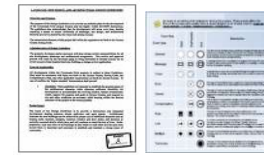
- Responsible for
 - Guidelines BA Framework
 - Inventarisation Business processes
 - Guidelines FA Framework
 - Inventarisation use-cases

- New functions are being created, names s.a.

Enterprise Business Process Owner

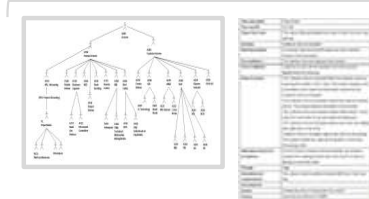
Business Process Improvement Manager

Guidelines BA Framework



BPMN Syntax

Enterprise Actors

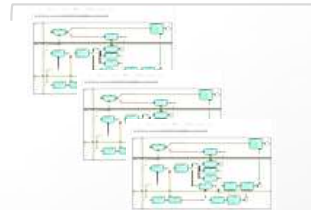


Enterprise Business Process Owner

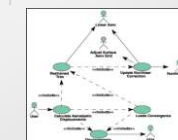
Project 'iPhone'



Project 'x, y, z'



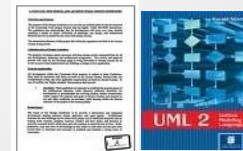
SubProject 'iPhone' A



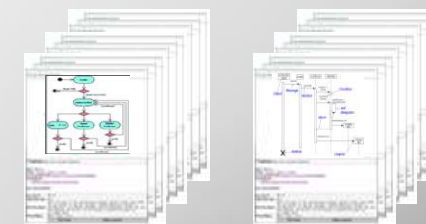
SubProject 'iPhone' B



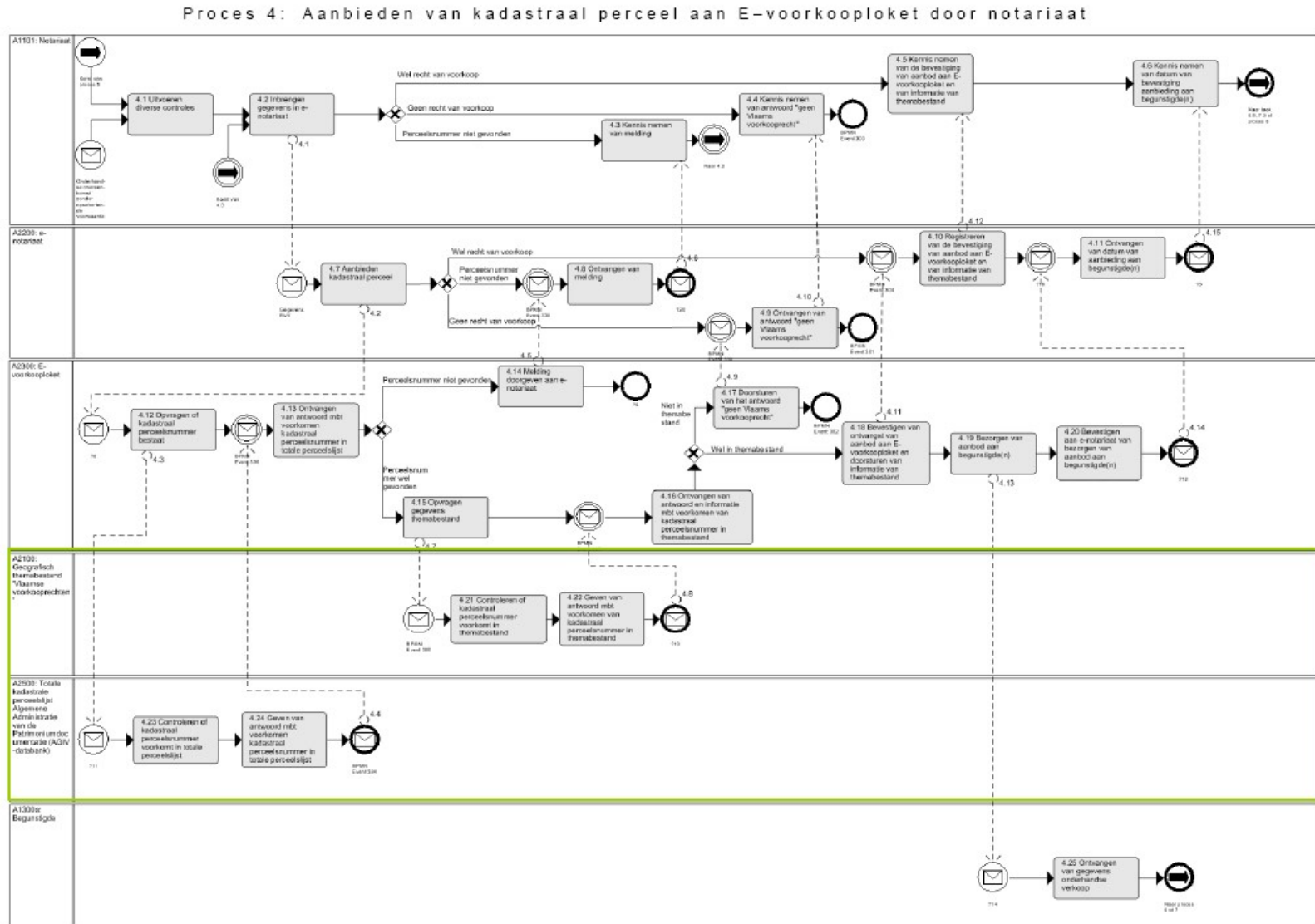
Guidelines FA Framework



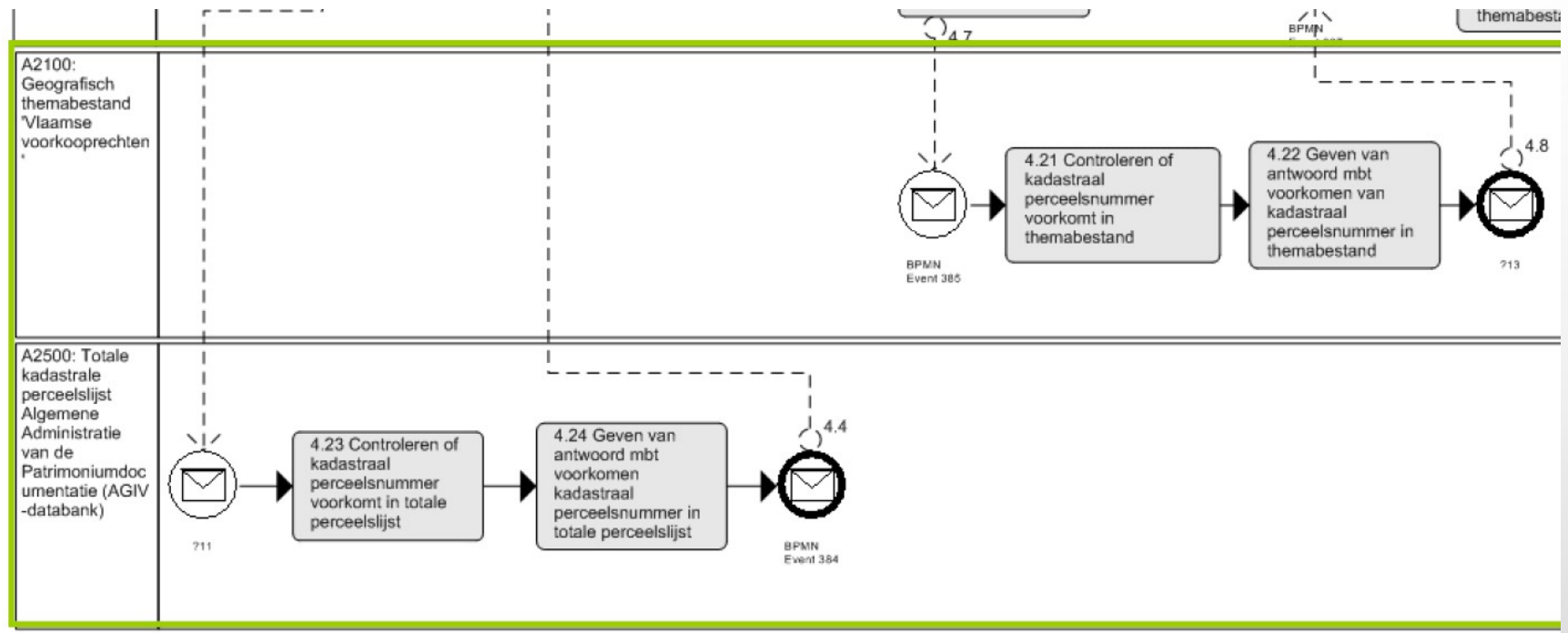
UML Syntax



Prioritise all activities for every end-to-end proces which has to be further analysed



Define all the activities the selected end-to-end proces which have to be further analysed



Activities 4.21 - 4.24

Info streams 4.3 4.4
4.7 4.8

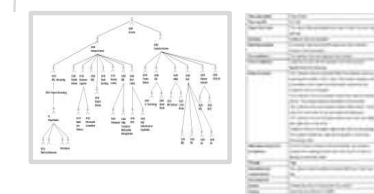
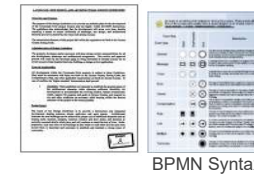
The connection

- Mapping table between BPMN processes and UML use-cases

Proces	Tot op een lager niveau uitwerken door AGV	Activiteiten	Infostromen die van belang zijn	Prioriteit	Moelijkheidsgraad [1-5]
1. Opvragen van informatie i.v.m. voorkeepsrecht via het geoloket 'Recht van voorkoop' door burger	/	/	/	/	/
2. Raadplegen van E-voorkeepsloket door leverancier	X	2.A.10-2.A.13 2.B.6-2.B.7	2.A.2, 2.A.3, 2.A.5, 2.A.6 2.B.2, 2.B.3	3	4
3. Raadplegen van E-voorkeepsloket door notariaat	X	3.13-3.16	3.3, 3.4, 3.7, 3.8	4	3
4. Aanbieden van kadastraal perceel aan E-voorkeepsloket door notariaat	X	4.21-4.24	4.3, 4.4, 4.7, 4.8	5	2
5. Inlichten van de begunstigde(n) bij openbare verkoop door notariaat	X	Nog te bepalen	Nog te bepalen	6	1
6. Uitoefenen van het voorkeepsrecht door begunstigde	/	/	/	/	/
7. Melden van het niet uitoefenen van	/	/	/	/	/

Guidelines BA Framework

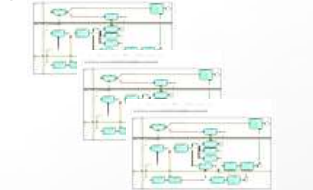
Enterprise Actors



Enterprise Business Processes

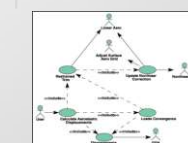
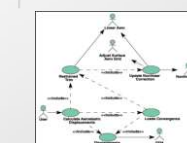
Project 'iPhone'

Project 'x, y, z'

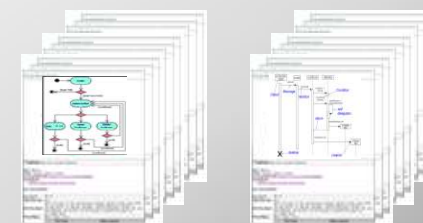


SubProject 'iPhone' A

SubProject 'iPhone' B



Guidelines FA Framework



Vision & Strategy

- (e)Awareness service
- (e)Transformation Readiness
 - Current State Assessment
 - Gap Analysis & Definition Roadmap
 - Business Case(s) & Planning

Go / No Go

■ RFP

■ RFP guidance

Vision & Strategy

3D ENTERPRISE BLUEPRINTING

Business Analysis

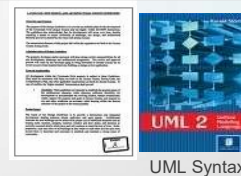
Business Analysis

WHAT

HOW

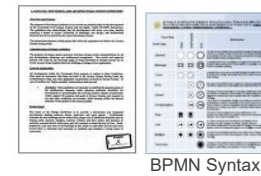
Functional Analysis

■ Guidelines FA Framework

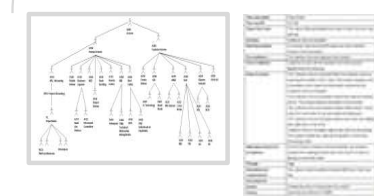


Functional Analysis

■ Guidelines BA Framework



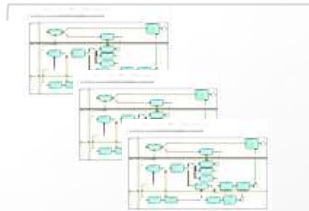
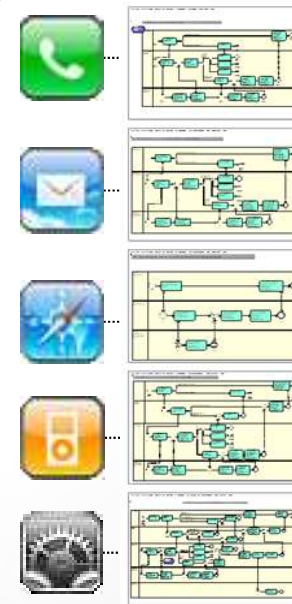
■ Enterprise Actors



Enterprise Business Processes

Project 'iPhone'

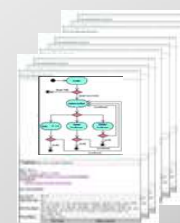
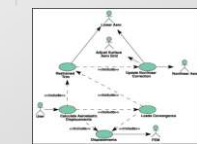
Project 'x, y, z'



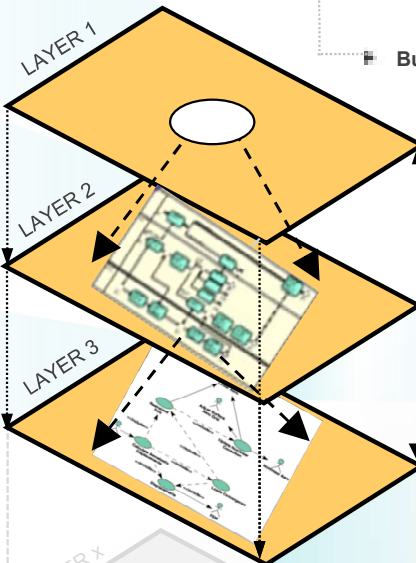
Process	1	2	3	4
Process 1	1	1	1	1
Process 2	1	1	1	1
Process 3	1	1	1	1
Process 4	1	1	1	1
Process 5	1	1	1	1
Process 6	1	1	1	1
Process 7	1	1	1	1
Process 8	1	1	1	1
Process 9	1	1	1	1
Process 10	1	1	1	1

SubProject 'iPhone' A

SubProject 'iPhone' B



Project Lifecycle



LAYER x



iPhone example

- BPMN tools
 - Drawing tools
 - Intelligent drawing tools
 - Full Life Cycle tools (from modeling to B.A.M.)
 - Cloud Life Cycle tools

More and more tools are supporting BPMN

We can define 3 sorts of tools:

1° **Drawing tools** with no intelligence behind the diagrams, only intelligence for fast drawing.

2° **Intelligent drawing tools** with intelligence behind the diagrams (connections allowed / not allowed).

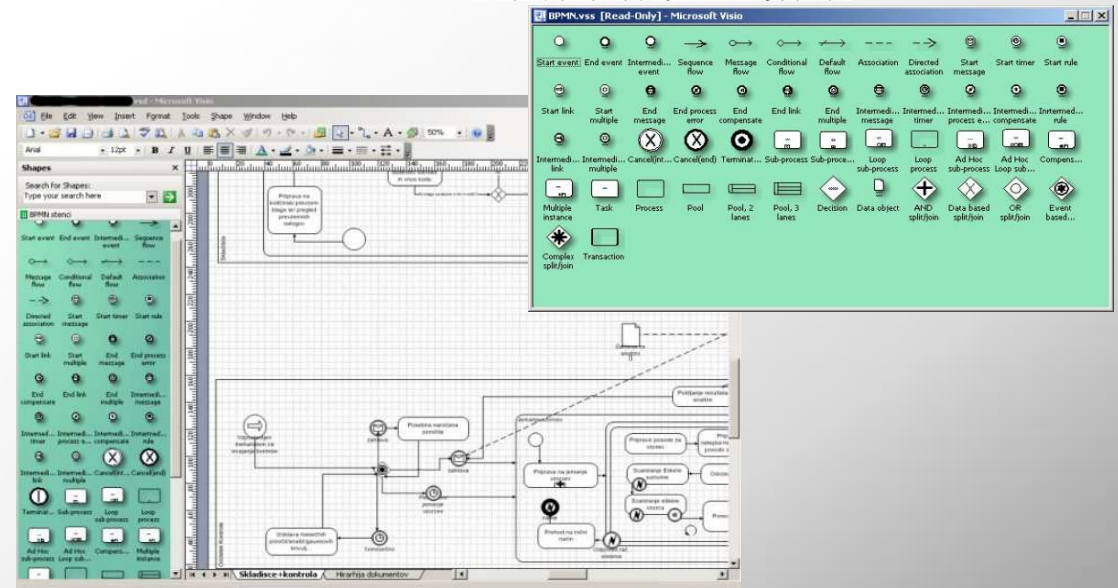
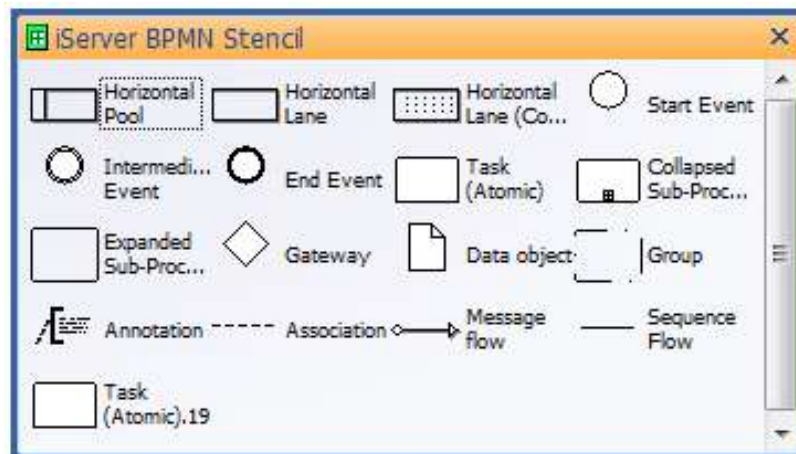
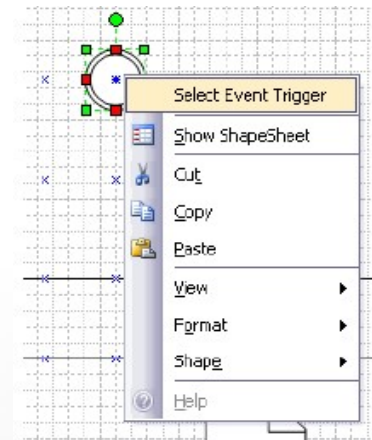
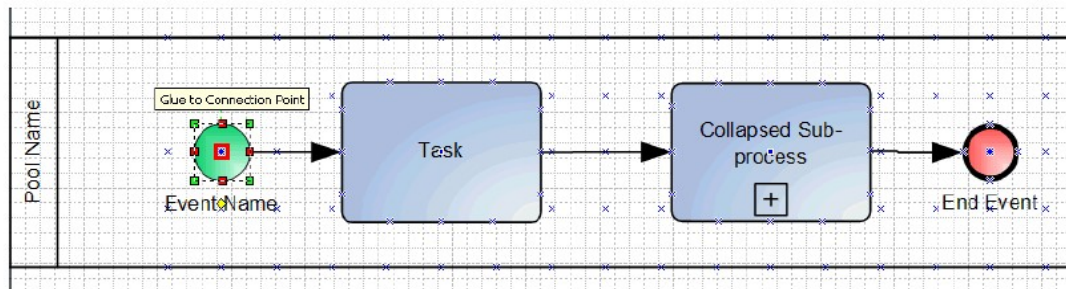
3° **Full life cycle tools** with intelligence behind the diagrams (connections allowed / not allowed) and end-to-end (from BPMN to BPEL to ...).

4° **Cloud life cycle tools** with SaaS capabilities behind the diagrams.

1^o Drawing tools

iSERVER: a stencil set for Microsoft Visio

Example: Stencil (.vss) usage from Orbus
Software iServer - BPMN Stencil v1.x

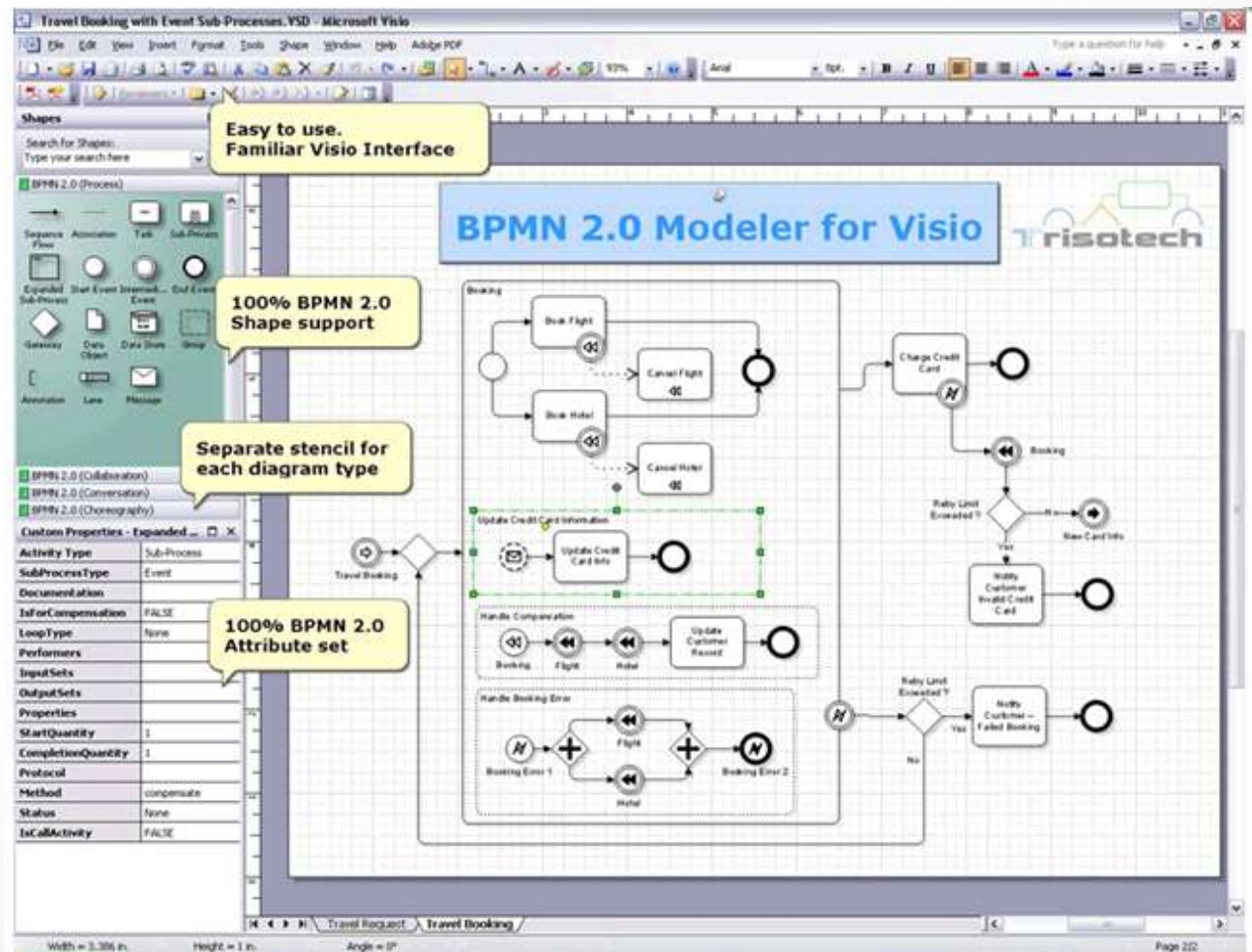


1° Drawing tools



BPMN 2.0 Modeler: a stencil set for Microsoft Visio

The BPMN 2.0 Modeler for Visio supports the complete proposed set of BPMN 2.0 elements, it allows users to produce Process diagrams, Collaboration diagrams, Choreography diagrams and Conversation diagrams as described in the proposed specification document from OMG.

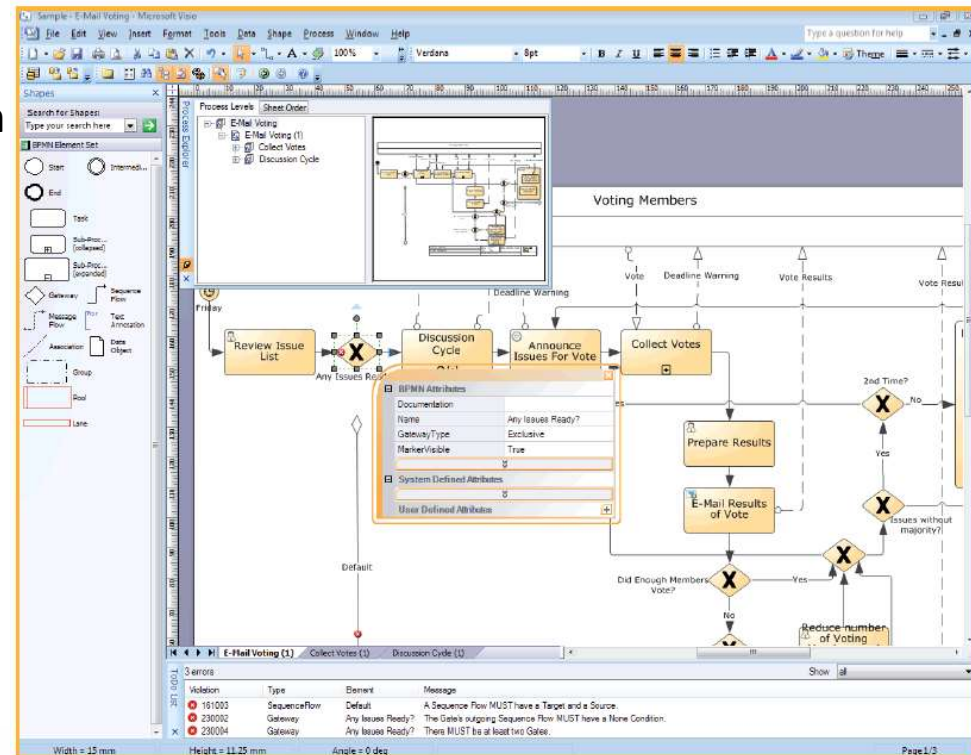


2° Intelligent drawing tools

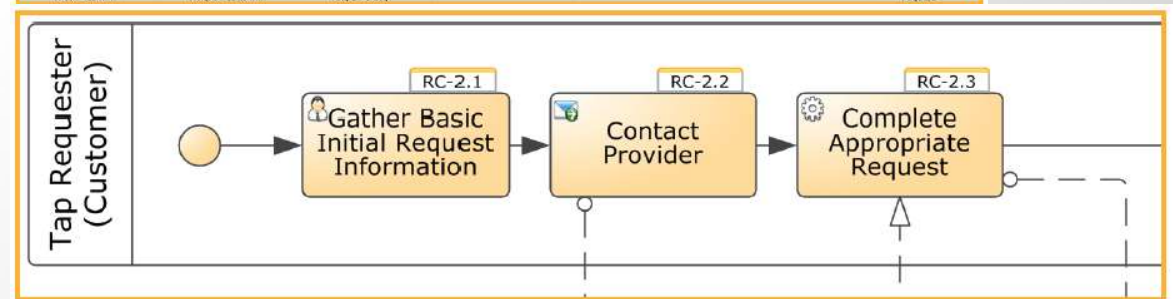


PROCES MODELER 5: a stencil and simulation set for Microsoft Visio

- 100% BPMN
- BPMN 2.0 Syntax validation



- Element numbering
- Documentation generation

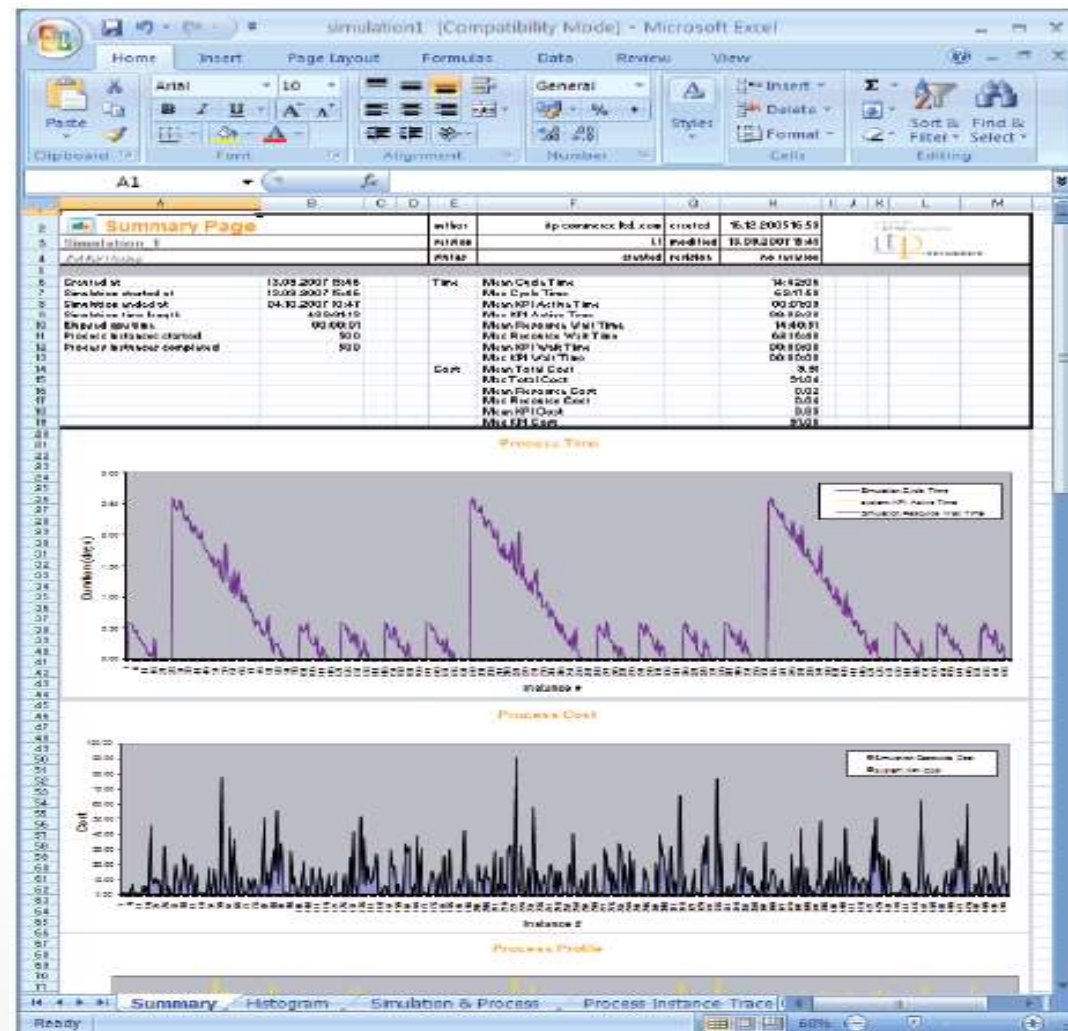


2° Intelligent drawing tools

PROCES MODELER: a stencil and simulation set
for Microsoft Visio



- Proces simulation
- Simulation output
- ITIL proces templates
- Risk and Controlling modeling for SOX

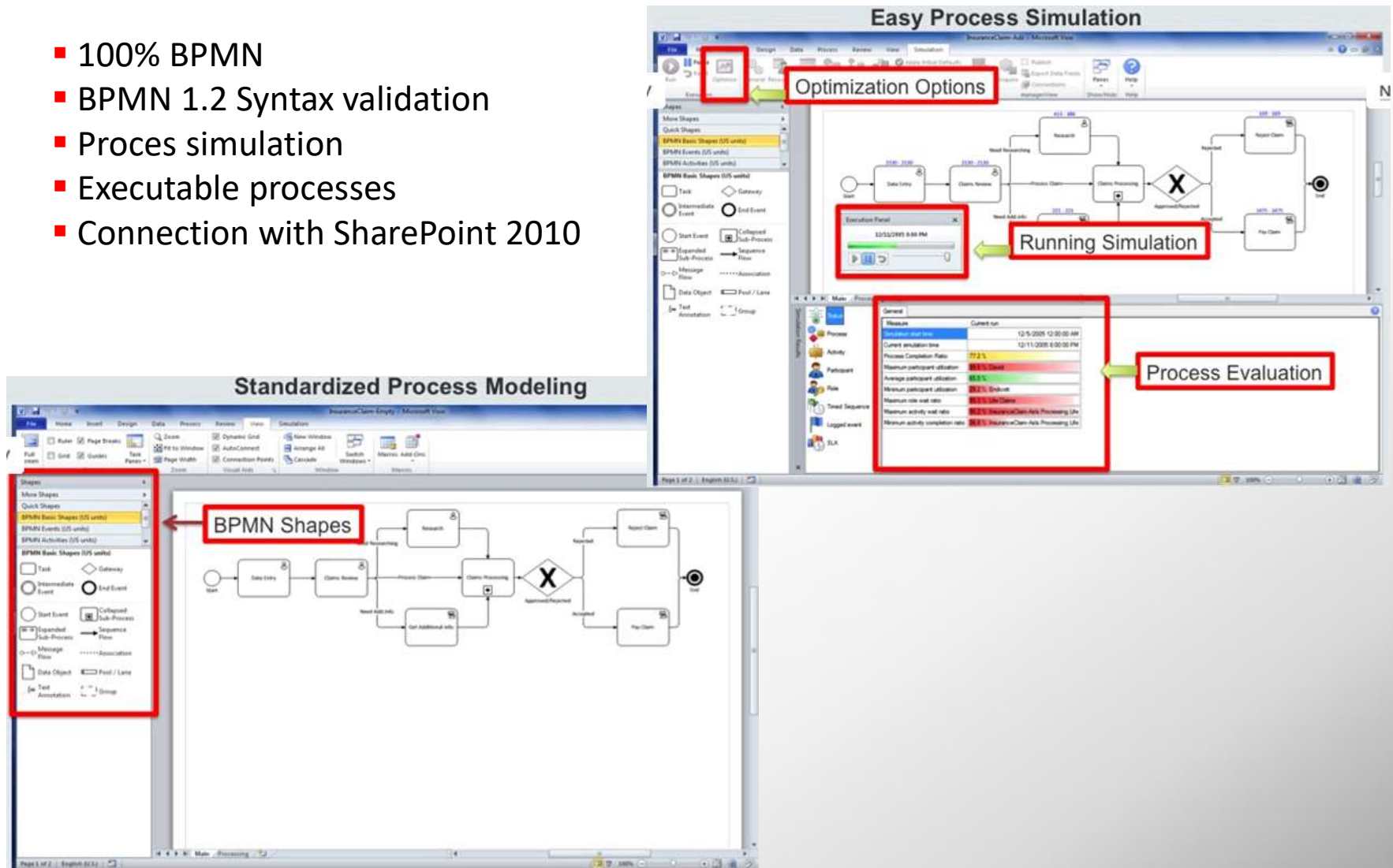


2° Intelligent drawing tools

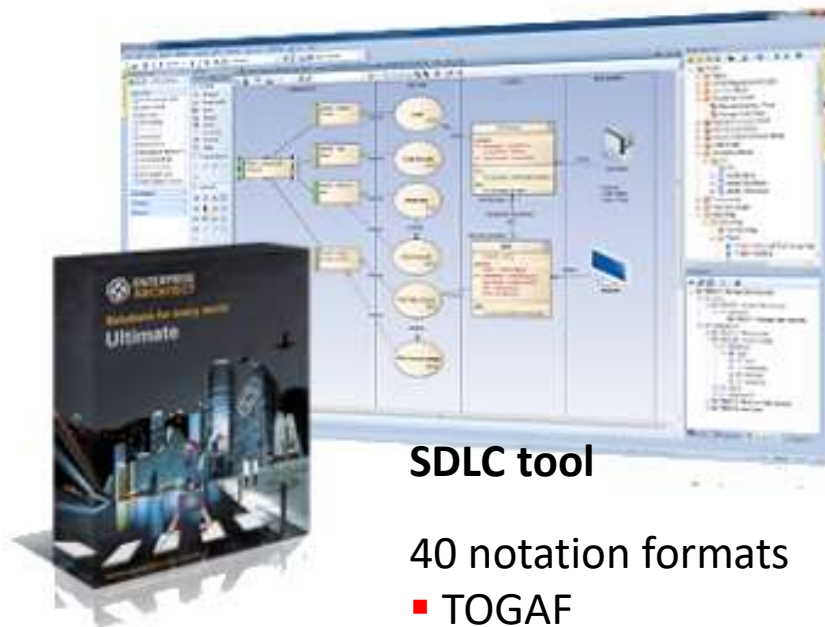
VISIO Premium 2010 & AnalystView 3.0 : a stencil and simulation set for Microsoft Visio



- 100% BPMN
- BPMN 1.2 Syntax validation
- Proces simulation
- Executable processes
- Connection with SharePoint 2010



2° Intelligent drawing tools

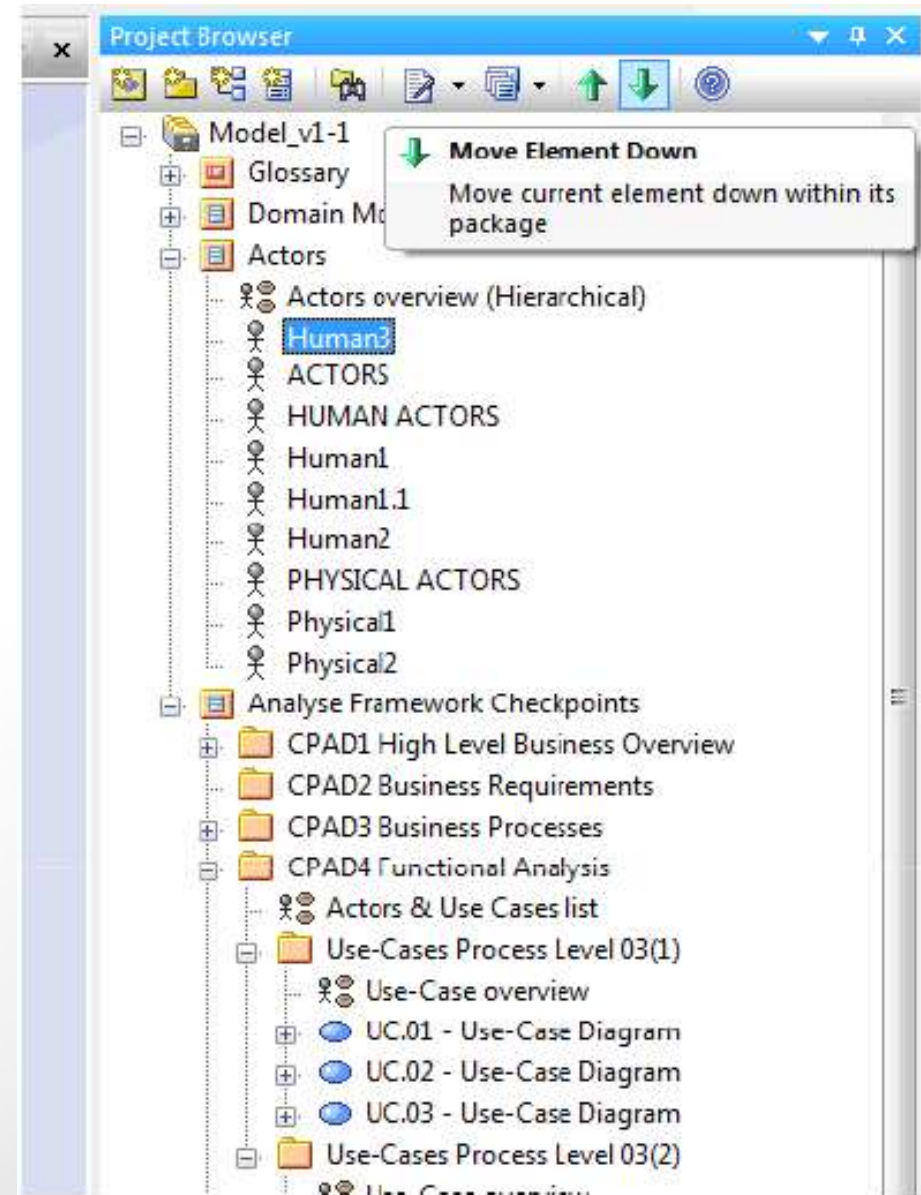


SDLC tool

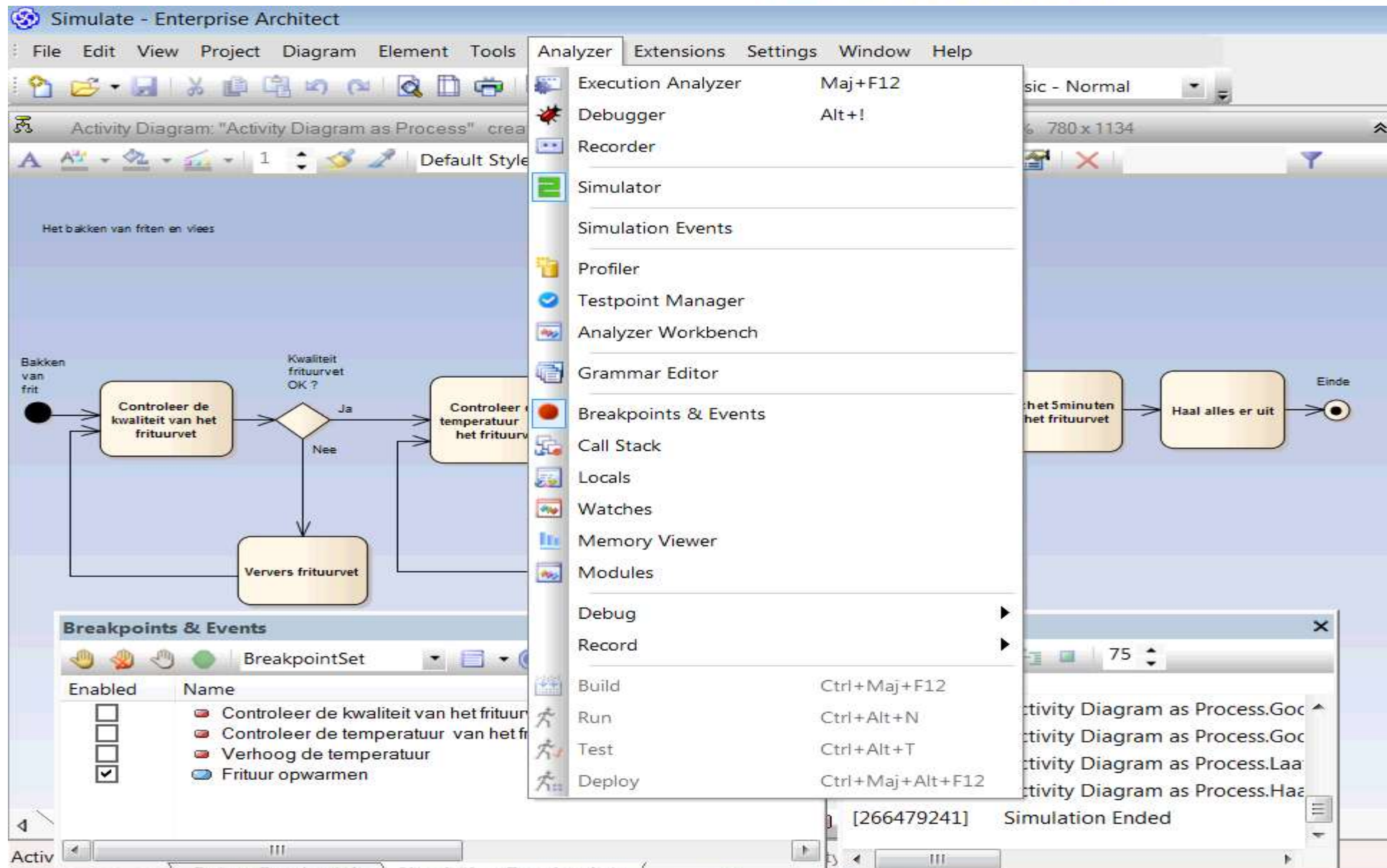
40 notation formats

- TOGAF
- ZACHMAN
- BPMN 1.2
- BPMN 2.0
- UML 2.0
- DFD
- ARCHIMATE 2.0
- MindMapping
- Screen design
- ...

LOW PRICE !

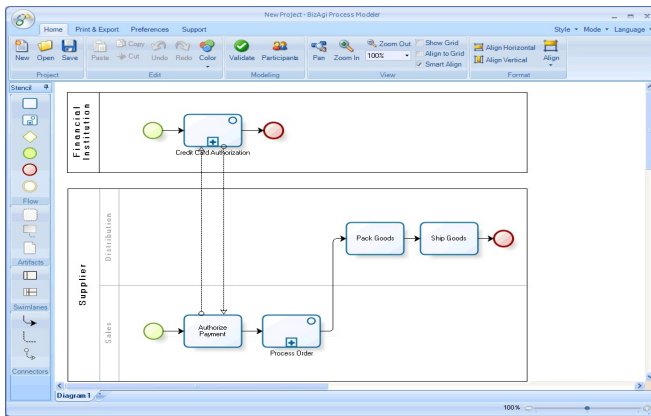


2° Intelligent drawing tools



3° Full life cycle tools

BIZAGI Xpress:



Model the Process

BizAgI allows process owners to graphically and intuitively model and modify even the most complex business processes in the organisations.

Process Data

Process data is defined in a structured model, thus enabling information entities to understand how they relate to each other.

Create Forms

BizAgI provides the tools required to create and design the screens that are to be presented to the users throughout the process.

These forms are visualized in the web application.

Define Business Rules

BizAgI includes in the process flow all the policies or conditions that must be accomplished and controlled in the organisation.

Assign Resources

BizAgI determines the proper employees or resources needed for each process activity.

Management Indicators

BizAgI automatically extracts process performance information, and submits it to the managers or analysts, thus making it possible to continuously optimise and expedite business process management.

Implementation Web Application

BizAgI automatically generates a web application, which is complemented with interfaces to communicate with existing systems.

Verify the Process

BizAgI not only verifies the process individually, but it also checks the adequate integration with associated processes.

In this way BizAgI guarantees the integrity of the data and the correct process flow.



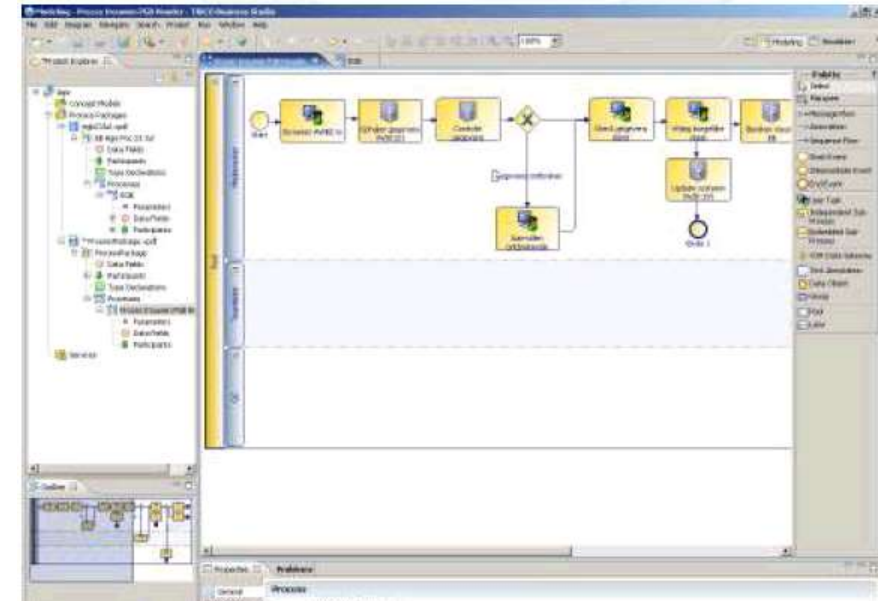
3° Full life cycle tools



TIBCO BPM SUITE (TIBCO Business Studio):

Business Analyst view:

- High level process design from end-to-end in BPMN



Rules engine view:

- Processes and Rules are separated
- Test-Lab included:
 - completeness
 - contradictness
 - detection loops

Rule ID	Rule Name	Rule Type	Rule Status	Rule Description
1	Rule 1	AND	Active	Rule 1 Description
2	Rule 2	OR	Active	Rule 2 Description
3	Rule 3	XOR	Active	Rule 3 Description
4	Rule 4	AND	Active	Rule 4 Description
5	Rule 5	OR	Active	Rule 5 Description
6	Rule 6	XOR	Active	Rule 6 Description
7	Rule 7	AND	Active	Rule 7 Description
8	Rule 8	OR	Active	Rule 8 Description
9	Rule 9	XOR	Active	Rule 9 Description
10	Rule 10	AND	Active	Rule 10 Description
11	Rule 11	OR	Active	Rule 11 Description
12	Rule 12	XOR	Active	Rule 12 Description
13	Rule 13	AND	Active	Rule 13 Description
14	Rule 14	OR	Active	Rule 14 Description
15	Rule 15	XOR	Active	Rule 15 Description
16	Rule 16	AND	Active	Rule 16 Description
17	Rule 17	OR	Active	Rule 17 Description
18	Rule 18	XOR	Active	Rule 18 Description
19	Rule 19	AND	Active	Rule 19 Description
20	Rule 20	OR	Active	Rule 20 Description
21	Rule 21	XOR	Active	Rule 21 Description
22	Rule 22	AND	Active	Rule 22 Description
23	Rule 23	OR	Active	Rule 23 Description
24	Rule 24	XOR	Active	Rule 24 Description
25	Rule 25	AND	Active	Rule 25 Description
26	Rule 26	OR	Active	Rule 26 Description
27	Rule 27	XOR	Active	Rule 27 Description
28	Rule 28	AND	Active	Rule 28 Description
29	Rule 29	OR	Active	Rule 29 Description
30	Rule 30	XOR	Active	Rule 30 Description

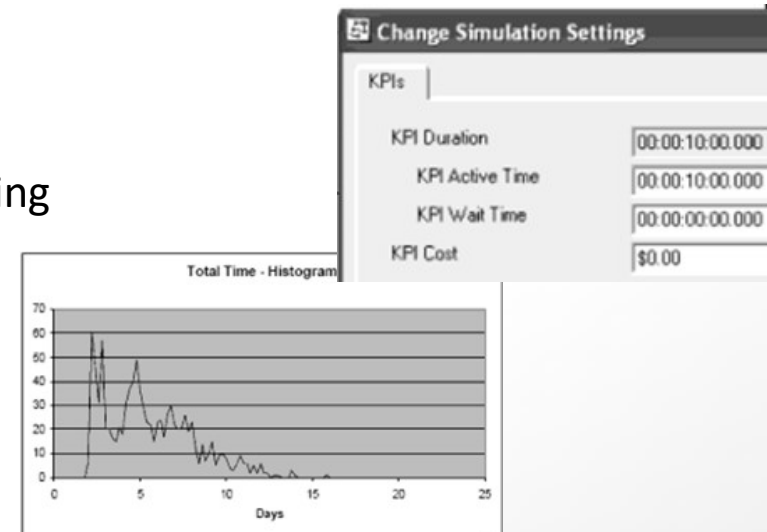
3° Full life cycle tools



TIBCO BPM SUITE (TIBCO Business Studio):

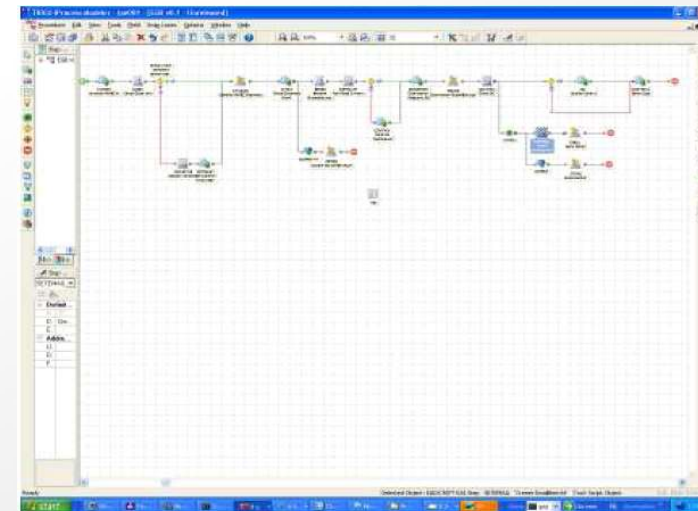
Simulation view:

- Simulate process and predicts performance improvement before building
- Input data (active time, wait time, probability in flow, cost, other KPIs ...)



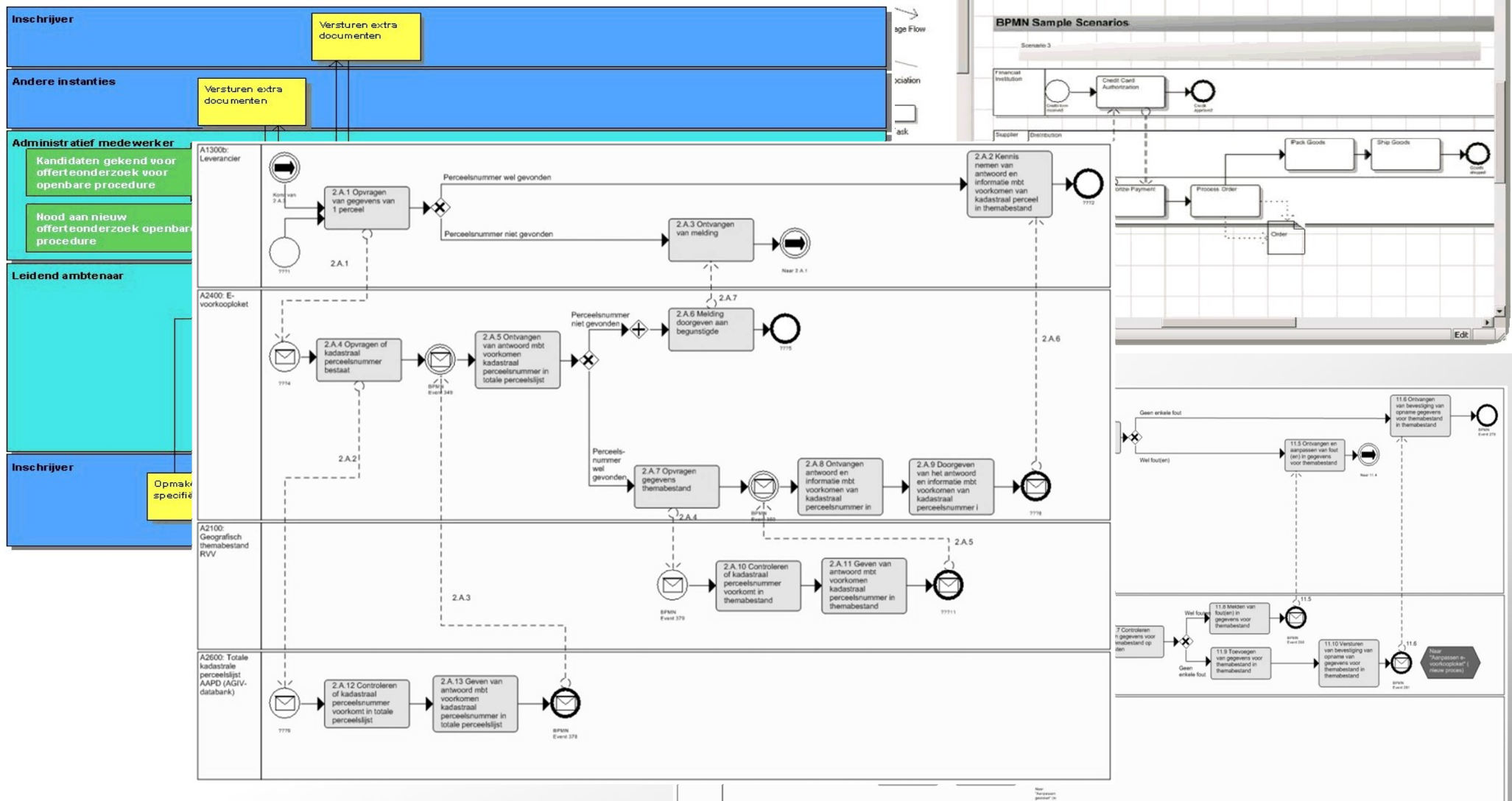
Implementer view:

- Environment for developer which can add technical issues to process.



3^o Full life cycle tools

CORPORATE MODELER: Standard Flemish Government



3° Full life cycle tools



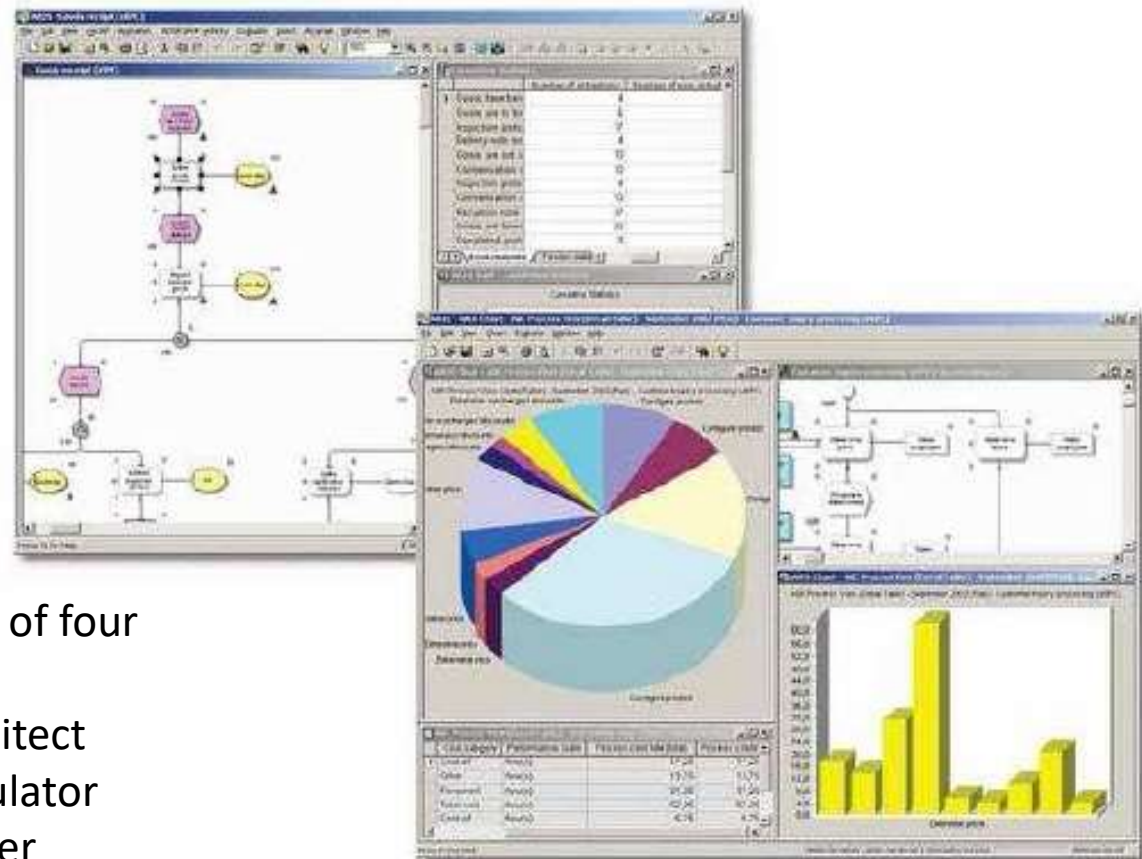
ORACLE BPM Suite 11gR1 :

The Oracle Business Process Analysis Suite provides the means for detailed process analysis.

It provides an integrated and comprehensive tool-set, powered by the industry leading ARIS Platform to model, simulate and publish your business processes.

Oracle BPM Suite is comprised of four components:

- Oracle Business Process Architect
- Oracle Business Process Simulator
- Oracle Business Process Server
- Oracle Business Process Publisher



3° Full life cycle tools

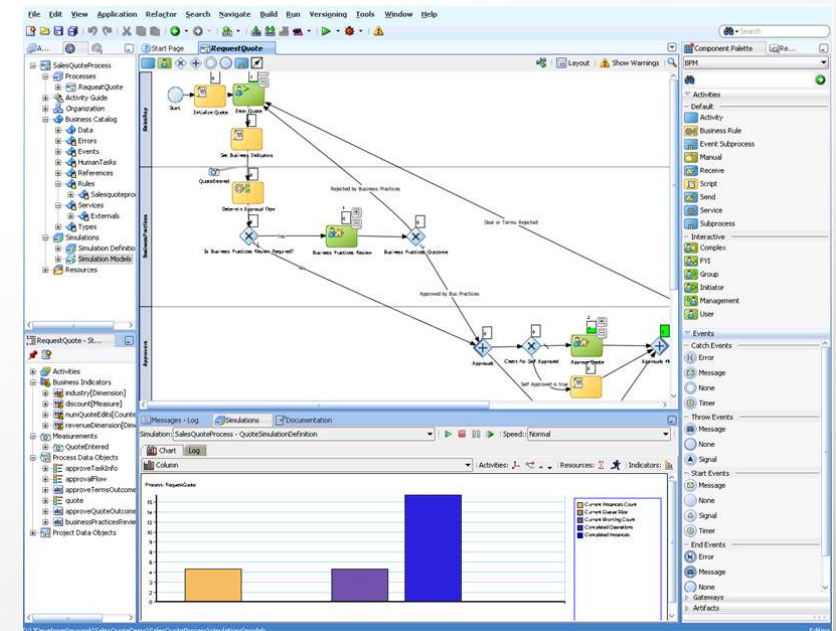
ORACLE®
BPM

ORACLE BPM Suite 11gR1 :

Was the ALBPM product, which became Oracle BPM10gR3, with the Oracle stack.

Some of the highlights of this release are:

- BPMN 2.0 modeling and simulation
- Web based Process Composer for BPMN and Rules authoring
- Zero-code environment with full access to
- Oracle SOA Suite's
- Process Spaces – Out-of-box integration with
- Web Center Suite
- Process Analytics – Native process cubes as
- well as integration with Oracle BAM



4° Cloud life cycle tools

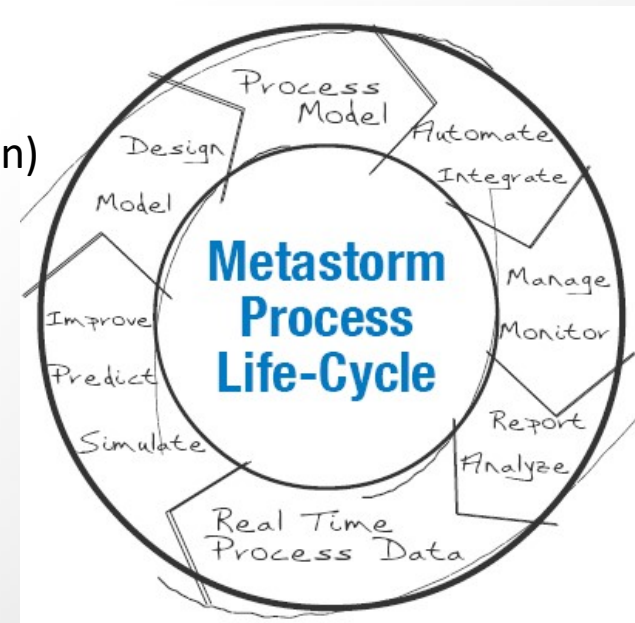
METASTORM M3



Metastorm was one of the first to bring together leading software for EA, BPA and BPM in an integrated software portfolio. With on-premise, **SaaS and Cloud-based** options, this powerful combination helps organizations define strategy, analyze change and automate and improve business processes, with clear visibility across the enterprise to optimize results. Social collaboration and role-based workspaces empower IT and business users to communicate more effectively and make better decisions.

- Strategic Planning
- Enterprise Architecture (DoDAF, FEA, Zachman)
- Process Improvement
- Quality Initiatives
- Six Sigma
- ISO Certification

- Process Documentation
- Service-Oriented Architecture
- Business Requirements
- UML Modeling
- BPEL

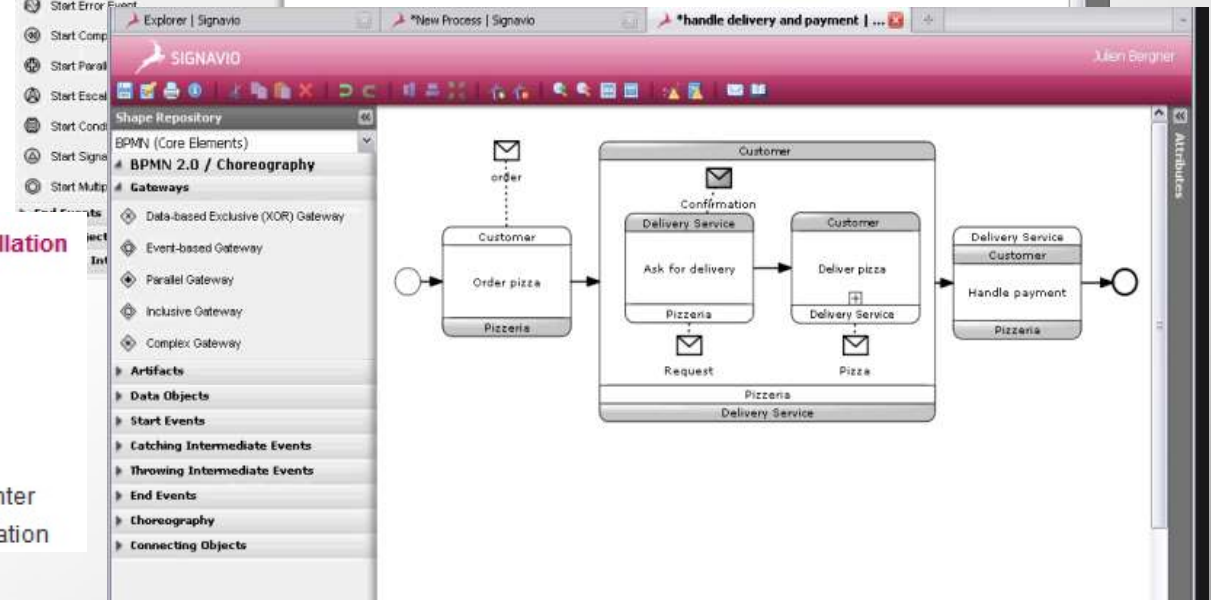
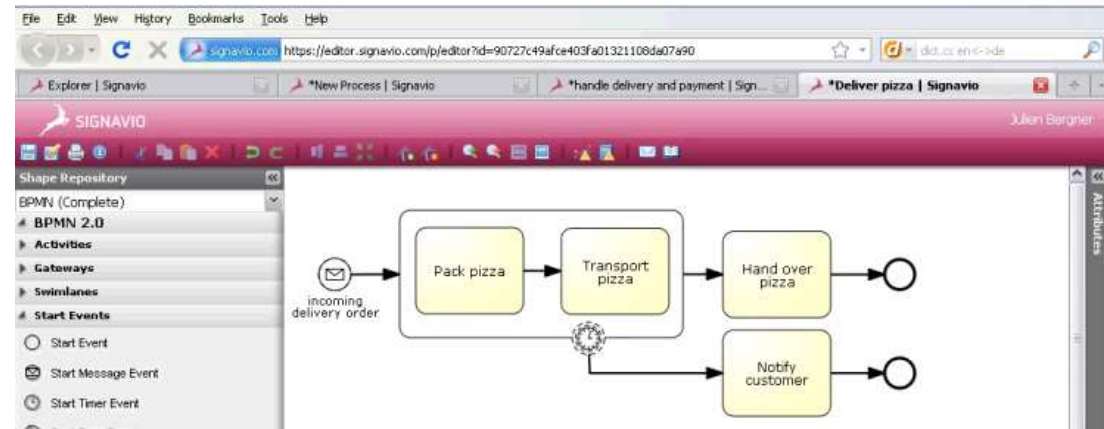


4° Cloud life cycle tools



SIGNAVIO Process Editor

- Roots with the [Hasso-Plattner-Institut](http://www.hasso-plattner-institut.de)
- Team Collaboration
- SaaS
- BPMN 2.0



	Software as a Service	On-Premise Installation
Standards support (BPMN 2.0, EPC)	✓	✓
Collaborative process design	✓	✓
Software installation on users' desktops	none	none
Server installation	hosted by Signavio	in your data center
Price	starting from 29,95€ / month	prices on application

4° Cloud life cycle tools



SIGNAVIO Process Editor

■ Installation types

	Software as a Service	On-Premise Installation
Standards support (BPMN 2.0, EPC)	✓	✓
Collaborative process design	✓	✓
Software installation on users' desktops	none	none
Server installation	hosted by Signavio	in your data center
Price	starting from 29,95€ / month	prices on application

■ SaaS Restrictions

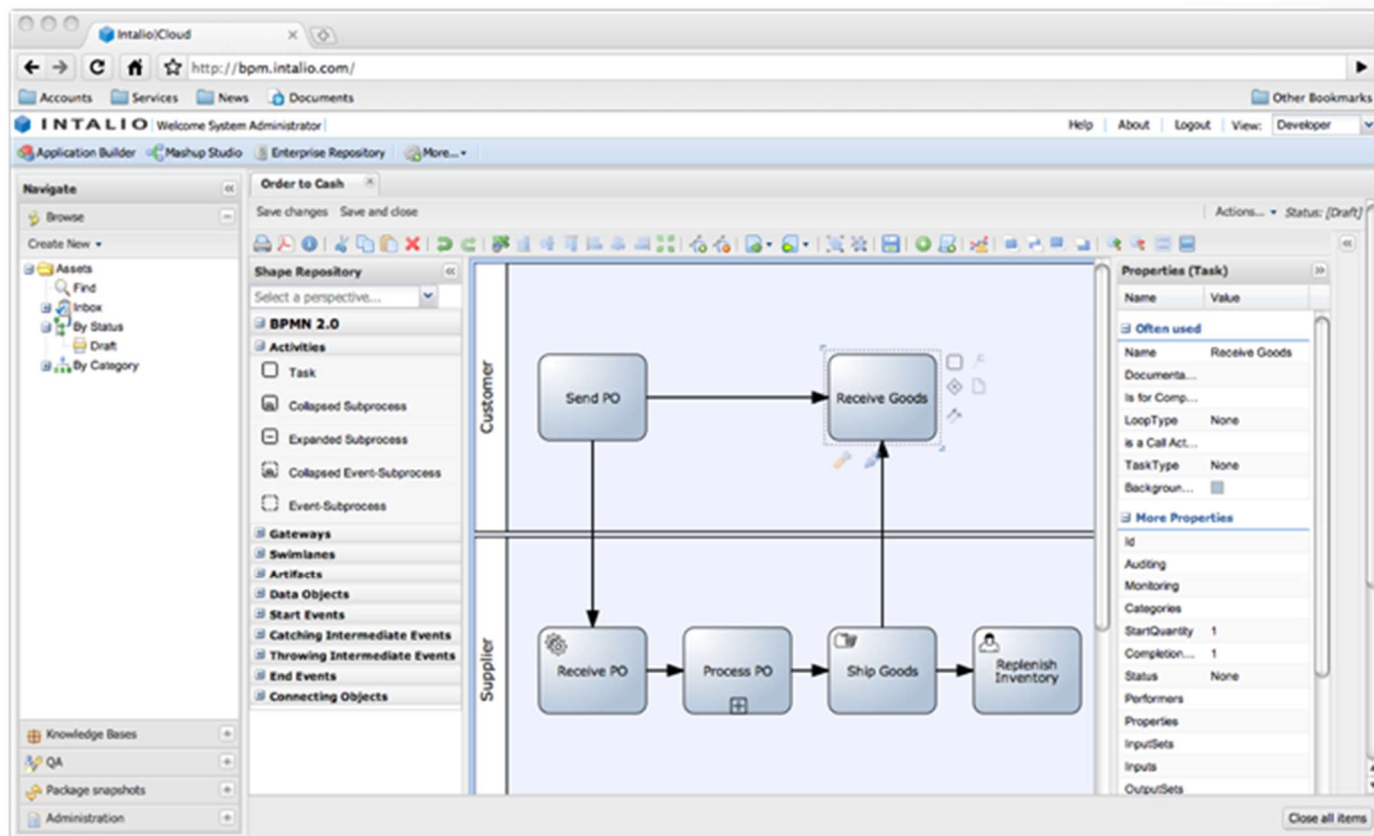
Compatibility matrix	Collaboration Portal	QuickModel	Explorer	Editor
Chrome 38 or newer	✓	✓	✓	✓
Firefox 31.2 or newer	✓	✓	✓	✓
Edge	✓	✓	✓	✓
Internet Explorer 11	✓	✓	✓	✓
Internet Explorer 9 / 10	✓	✓	✓	✓
Safari 7 or newer	✓	✓	✓	✓
Safari Mobile 7 (iOS 7) or newer	✓	✓	✓	✓

4° Cloud life cycle tools



INTALIO Cloud / Helium:

It's a database application builder, it's CRM and case management, document management, social networking and online office tools. It's built for the cloud, all browser-based (Ajax, no Flash. Runs on all browsers, iPad...) It's free for 5 users or less, with **SaaS subscription** pricing for production deployment.

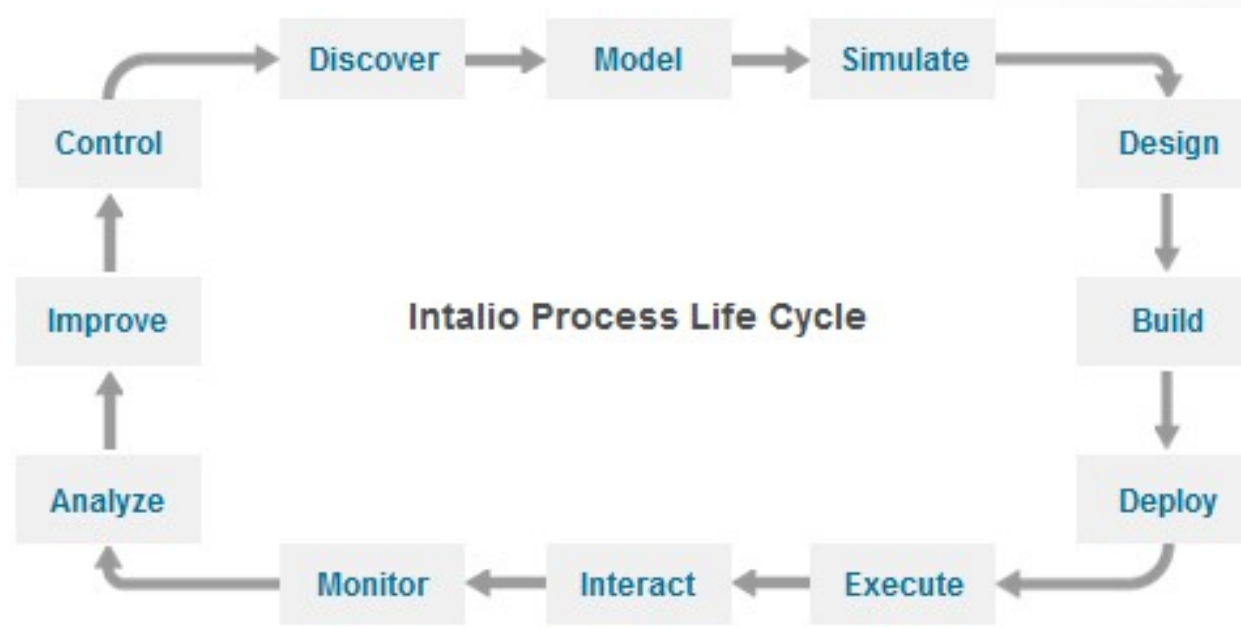


4° Cloud life cycle tools



INTALIO Cloud / Helium:

The features offered by Intalio|BPM are organized across a twelve-step life cycle for business processes, from process discovery to process control. This unique life cycle is the ultimate result of more than 10 years of Research & Development, and thousands of production deployments. This list of feature relates to the Intalio|BPM Fall '10 release.



4° Cloud life cycle tools



INTALIO Cloud / Helium:

The Intalio|Social BPM combines Intalio|BPM and Intalio|Social Portal to deliver a centralized environment where employees, customers, and business partners can collaborate on the management of business processes through their entire life cycle.

The features offered by **Intalio|Social BPM** are organized across a six-step life cycle for social collaboration, from content creation to system control. This life cycle enables secure collaboration between employees, customers, and business partners, using tools and communication patterns they are already familiar with.



More and more tools are supporting BPMN

The 'complete' list of BPMN tools/implementers:

<http://www.bpmn.org/#tabs-implementers>

(02/2023)

Current Implementations of BPMN (74 listed)



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<https://www.instagram.com/gijfelsdotcom/>



<https://www.pinterest.com/gijfelsdotcom/>



<https://www.youtube.com/c/ChristianGijfels/>

