

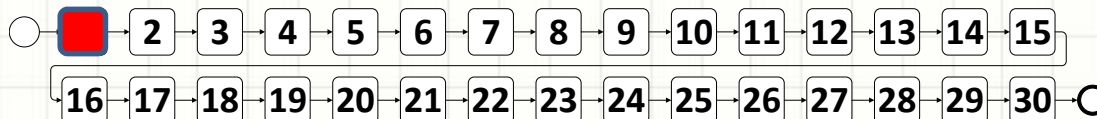
# Atelier public du Praxeme Institute

Mardi 25 novembre 2014

Praxeme et...  
les règles métier  
pour prendre des décisions

**Thierry BIARD**

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# Thierry BIARD

- Consultant indépendant – **A M B E S A S E I R L**

Chef de Projets IT

Spécialiste EDI & EAI

Domaine Transport & Logistique



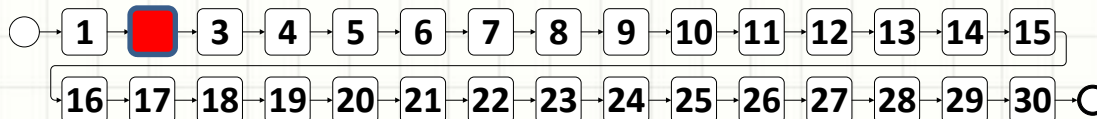
- Projet de recherche doctoral

Laboratoire Génie Industriel

École Centrale Paris & Lille

<http://www.lgi.ecp.fr/pmwiki.php/PagesPerso/TBiard>

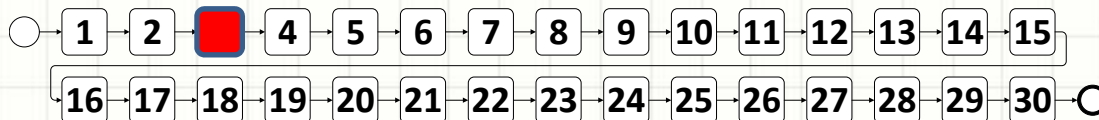
A M B E S A S



# Sommaire

- Projet de recherche doctoral sur l'Architecture d'Entreprise.
- Présentation du nouveau standard de l'OMG DMN (Decision Model and Notation) pour la formalisation des prises de décision selon les règles métier.
- Complémentarité de DMN avec d'autres standards de l'OMG : BMM, SBVR, CMMN et surtout BPMN.
- Éléments graphiques et langage de DMN. Interfaçage avec BPMN 2.0.
- Travail sur le métamodèle de DMN pour un projet d'outillage.
- Débat, échange sur ces sujets et sur leur capacité d'apport méthodologique.

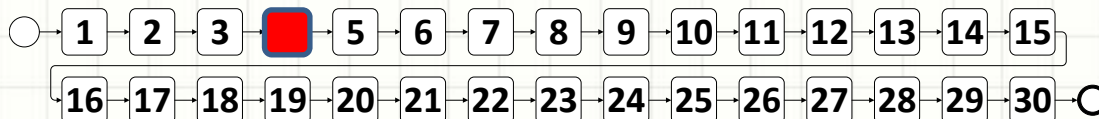
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# Projet de recherche doctoral sur l'Architecture d'Entreprise 1/2

- Comment rendre la méthode publique d'Architecture d'Entreprise Praxeme encore plus rigoureuse\* et plus efficace\*\* ?
  - \* avec une approche scientifique pour la preuve de concept
  - \*\* avec une démarche d'ingénierie pour la mise en application

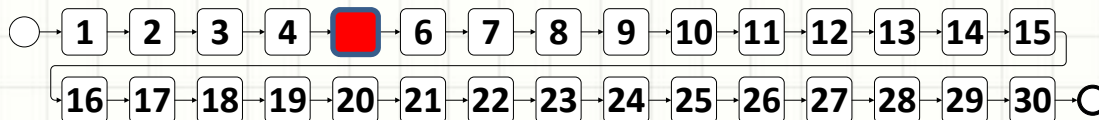
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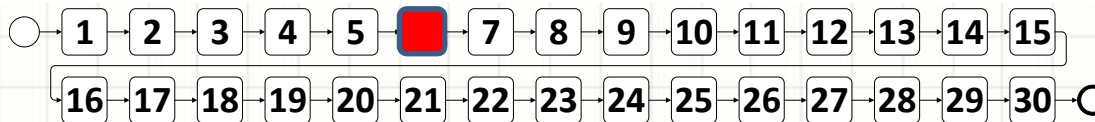
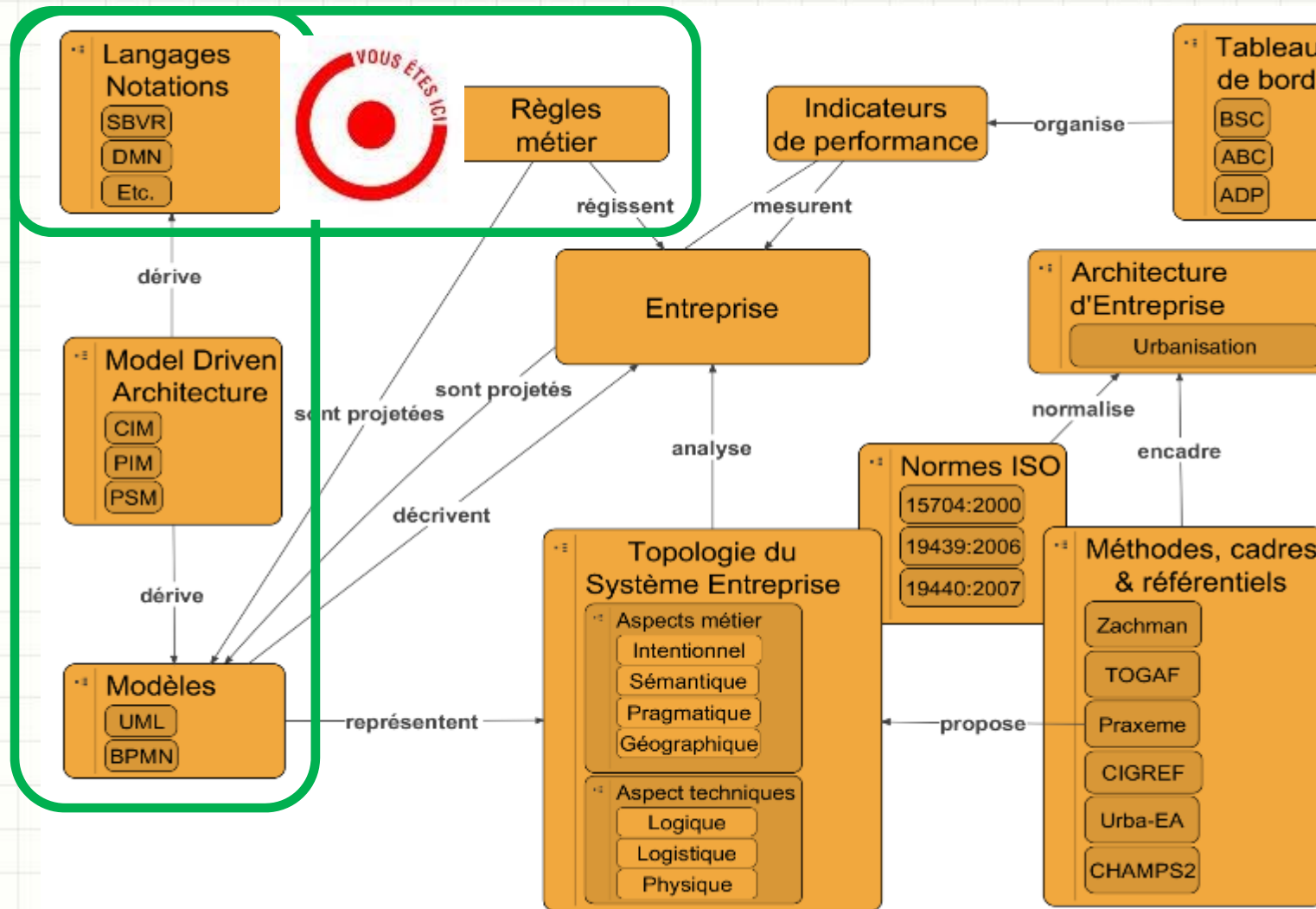
# Projet de recherche doctoral sur l'Architecture d'Entreprise 2/2

- Trois sous-projets pour cet enjeu :
  - a) Formalisation des règles métier
  - b) Organisation des indicateurs de performance  
Intégration de l'Arbre de Performance dans Praxeme
  - c) Dérivation automatisée des modèles  
et incidences sur a) & b)  
Vérification de la persistance des règles et des indicateurs

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# Carte conceptuelle du projet





# Les grands pourvoyeurs de standards



## ISO 15704:2000

Requirements for enterprise-reference architectures and methodologies

## ISO 19439:2006

Framework for enterprise modelling

## ISO 19440:2007

Constructs for enterprise modelling



OWL Web Ontology Language

SWRL Semantic Web Rules Language

RIF Rule Interchange Format

XPath XML Path language



BABOK (Business Analyst Body Of Knowledge) Guide

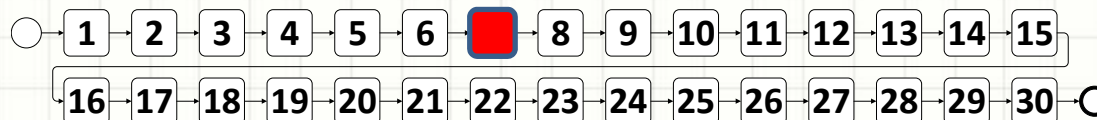


TOGAF

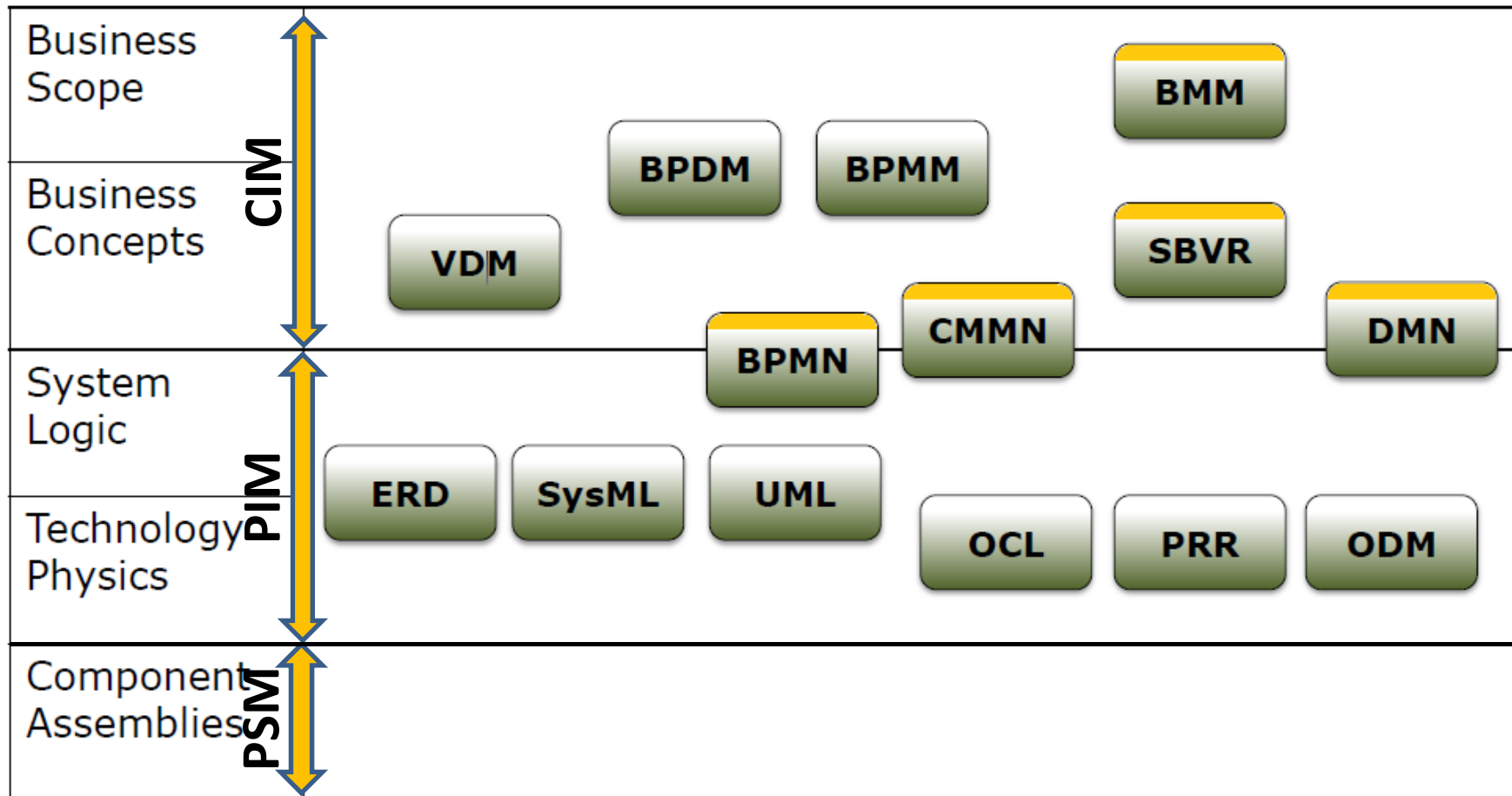
ArchiMate



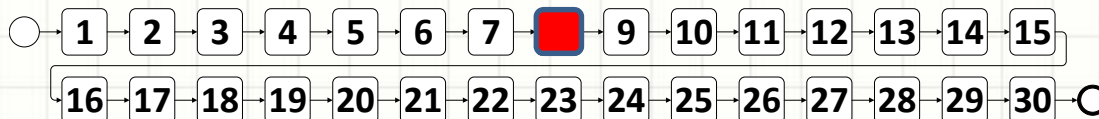
Diapositives suivantes  
(Versions et dates)



# Les standards de l'OMG pour les modèles d'Entreprise



© BCS – Dr. Juergen Pitschke 2003-2013, [www.enterprise-design.eu](http://www.enterprise-design.eu)

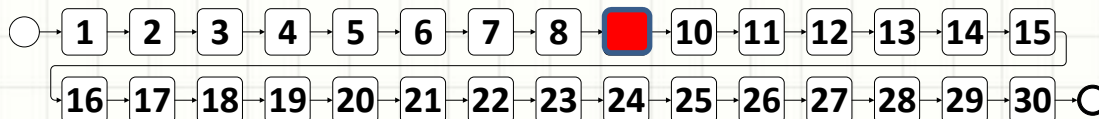




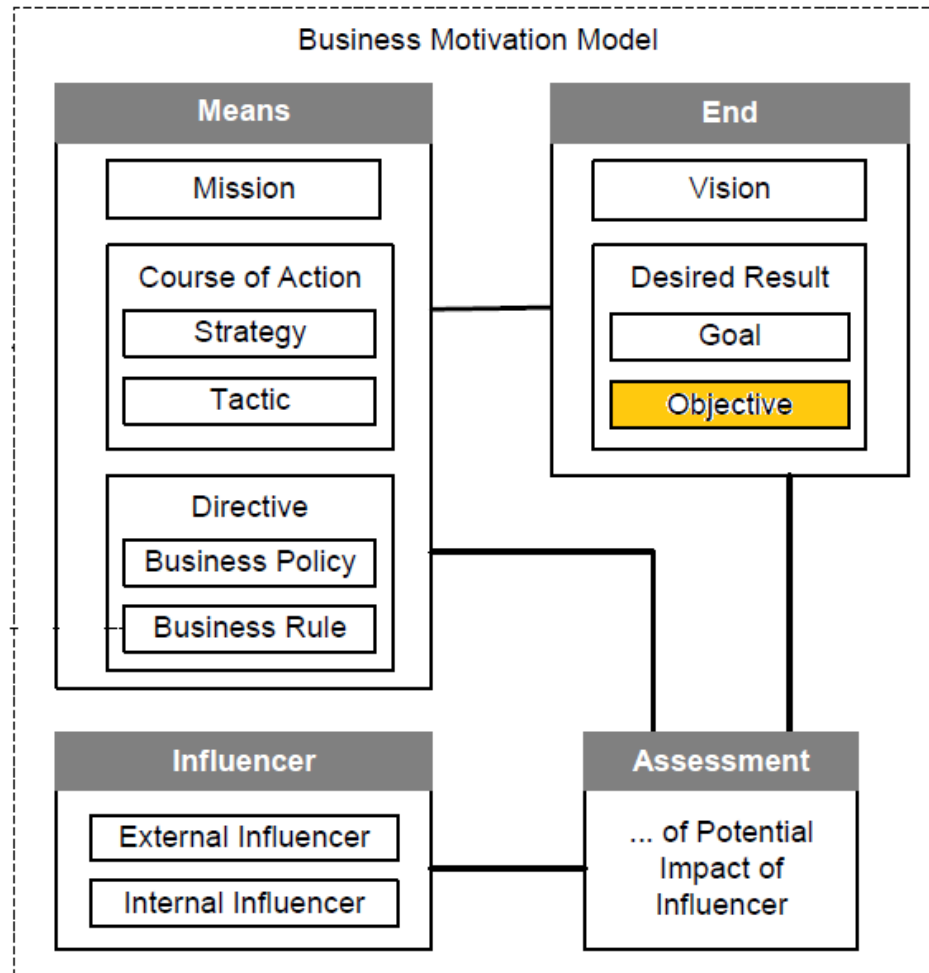
# BMM (Business Motivation Model) 1/2

- BMM v. 1.0 août 2008 → v. 1.2 mai 2014
  - DMN v. 1.0 β s'appuie sur la version 1.1 de mai 2010
- Proposé la Business Rules Community
- BMM s'appuie sur SBVR
- BPMN peut s'appuyer sur BMM également
- DMN reprend la définition des objectifs (*supportedObjective* qui est une instance de *Objective*) de BMM (Business Motivation Model)

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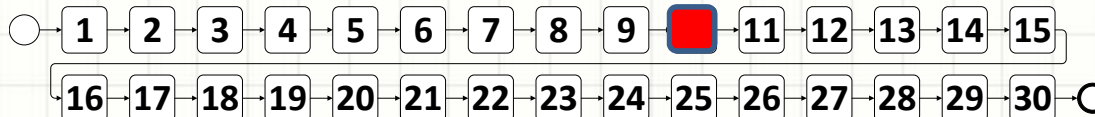


# BMM (Business Motivation Model) 2/2



- BMM fait référence au cadre de Zachman :
  - Why,
  - Who,
  - How.
- ArchiMate fait référence à BMM

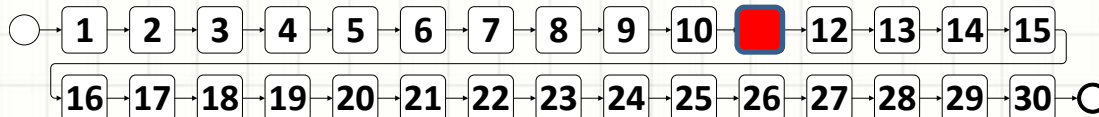
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# SBVR (Semantics of Business Vocabulary and Rules) 1/1

- V. 1.0 janvier 2008 → V. 1.2 novembre 2013
- Proposé la Business Rules Community
- Pas de référence explicite à SBVR dans DMN mais usage fortement recommandé
- Pas d'adoption massive de ce standard
- Exemple : **The age of each customer must be greater than 18.**

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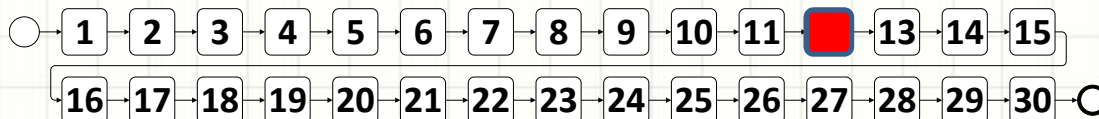


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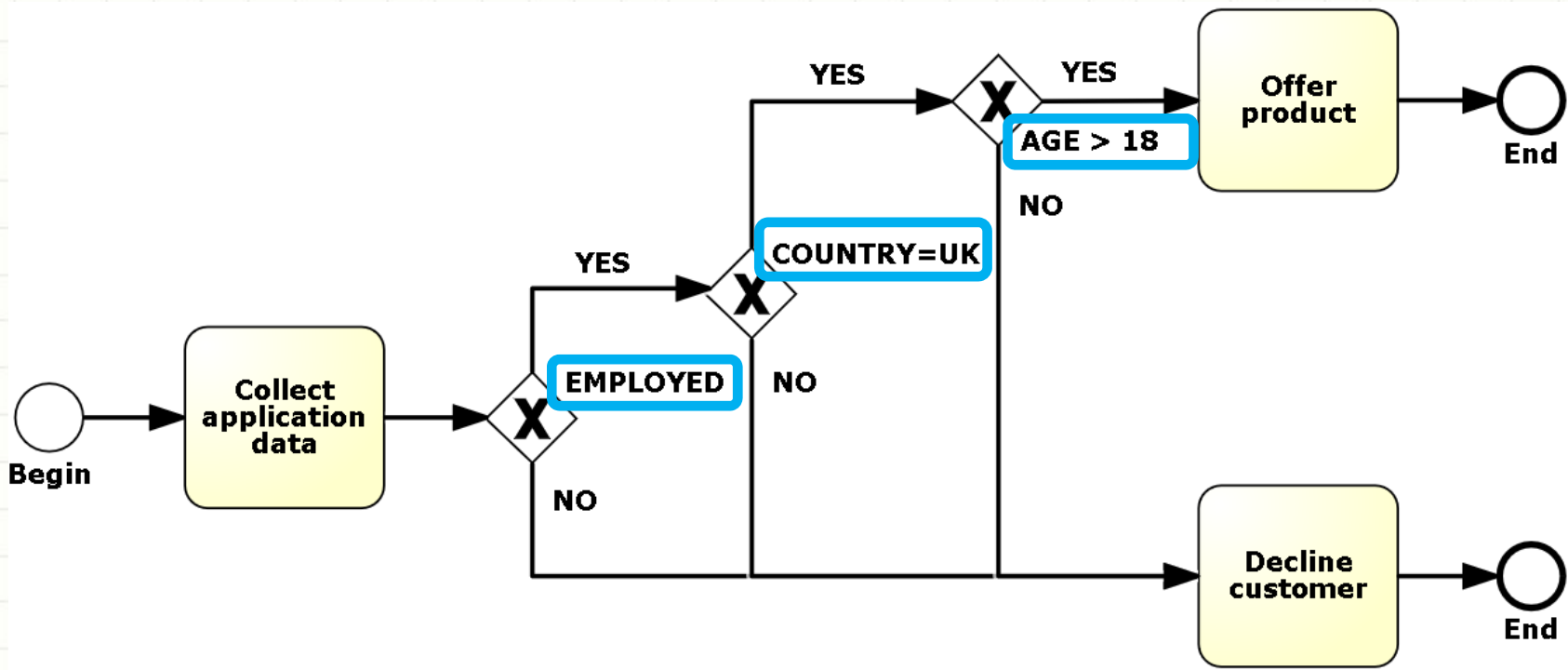
# BPMN (Business Process Model and Notation) 1/2

- V. 1.1 janvier 2008 → V. 2.0.2 décembre 2013
  - La version 1.0 fut publiée par BPMI en mai 2003
- Succès international & commercial
- Nombreux outils gratuits & payants
- Possibilité de générer du code exécutable
- S'ouvrir à d'autres standards pour avoir du succès
- La version 2.0 BPMN a préparé l'arrivée de DMN
- Identifier les points de décision dans les process

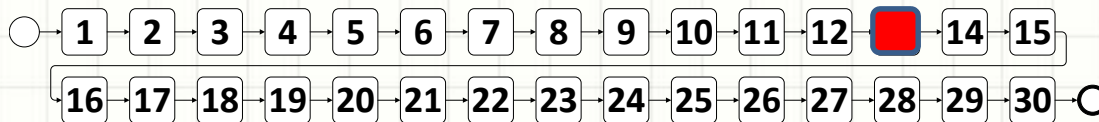
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# Modélisation de processus avec BPMN sans DMN 2/2



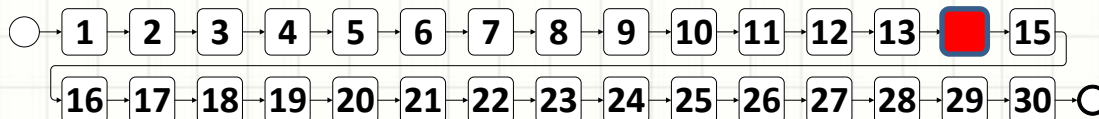
Collaboration Diagram (BPMN)





# CMMN (Case Management Model and Notation) 1/2

- Version 1.0 mai 2014
- BPMN prédictif (Un processus est décrit en une séquence prédéfinie d'activités : la routine)
- Pour une approche plus libre et plus flexible : CMMN Adaptive Case Management (non prédictif)
- CMMN devrait recommander DMN dans sa prochaine version
- Dr Pitschke (BCS) pense que BPMN+CMMN+DMN est la trilogie pour les projets BPM réussis grâce à son approche holistique !



# CMMN (Case Management Model and Notation) 2/2

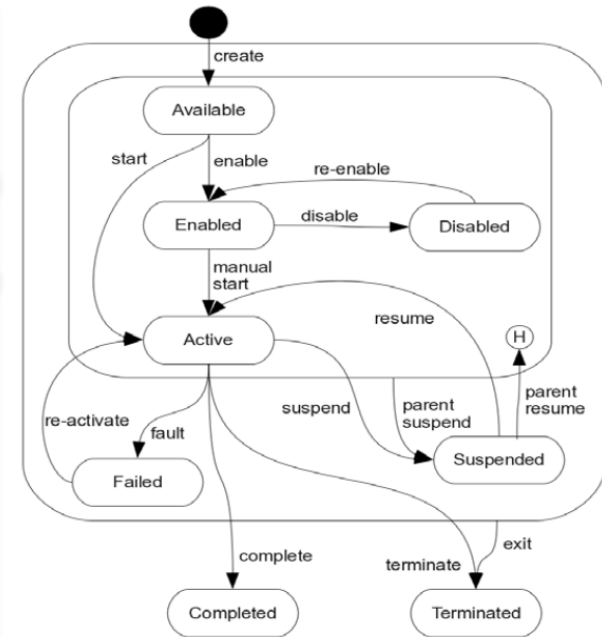
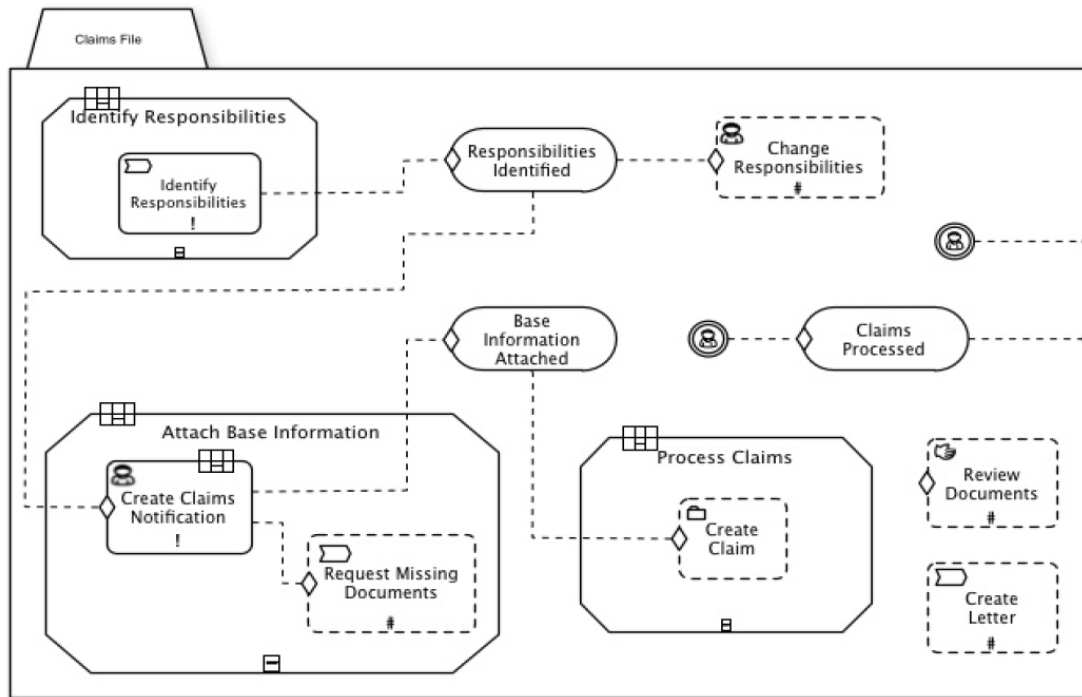
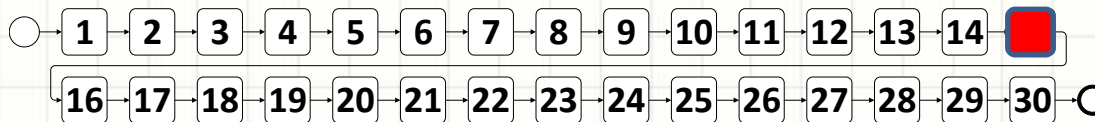


Figure 6.63 - Claims Management Example

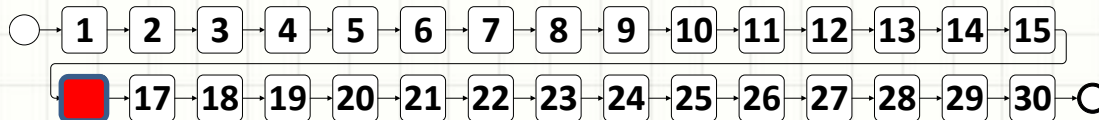
Figure 7.3 - Lifecycle of a Stage or Task instance



# DMN : Decision Model and Notation 1/2

- Version 1.0 Bêta 1 de février 2014
- Une notation standard pour modéliser les prises de décision et les règles métier
- Facilement compréhensible par les utilisateurs
- Pour formaliser les exigences des décisions, mais aussi pour automatiser ces décisions
- Déterminer la valeur de sortie (l'option choisie) à partir des valeurs des entrées, selon une logique métier prédéfinie de décision

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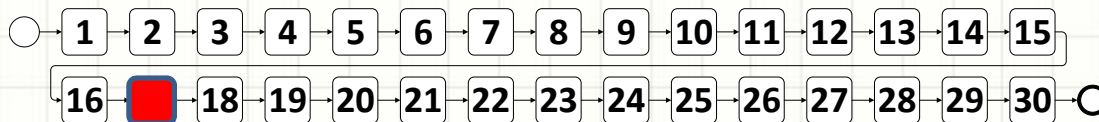


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# DMN : Decision Model and Notation 2/2

- Une spécification de 172 pages (PDF)
- Deux solutions pour exprimer la logique de décision :
  - Le langage FEEL (Friendly Enough Expression Language)
  - Les tables de décision
- Un métamodèle au format MOF (XMI)
  - qui s'ouvre surtout avec MagicDraw !
- Conçu pour être complémentaire de BPMN

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## Activities



**Task**  
A Task is a unit of work, the job to be performed. When marked with a symbol it indicates a Sub-Process, an activity that can be refined.



**Transaction**  
A Transaction is a set of activities that logically belong together; it might follow a specified transaction protocol.



**Event Sub-Process**  
An Event Sub-Process is placed into a Process or Sub-Process. It is activated when its start event gets triggered and can interrupt the higher level process context or run in parallel (non-interrupting) depending on the start event.



**Call Activity**  
A Call Activity is a wrapper for a globally defined Task or Process reused in the current Process. A call to a Process is marked with a symbol.

### Activity Markers

Markers indicate execution behavior of activities:

- Sub-Process Marker
- Loop Marker
- Parallel MI Marker
- Sequential MI Marker
- Ad Hoc Marker
- Compensation Marker

### Task Types

Types specify the nature of the action to be performed:

- Send Task
- Receive Task
- User Task
- Manual Task
- Business Rule Task
- Service Task
- Script Task

### Sequence Flow

defines the execution order of activities.

### Default Flow

is the default branch to be chosen if all other conditions evaluate to false.

### Conditional Flow

has a condition assigned that defines whether or not the flow is used.

## Conversations

A Conversation defines a set of



**Send Task**



**Receive Task**



**User Task**



**Manual Task**



**Business Rule Task**



**Service Task**



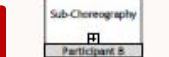
**Script Task**

## Choreographies

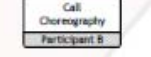
Participant A

Participant A

Participant A

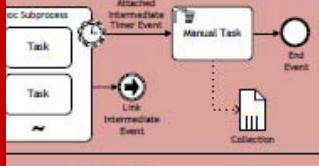
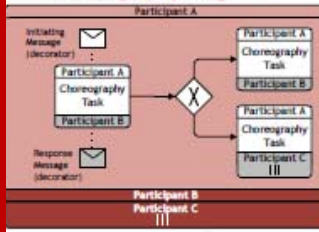


A Sub-Choreography contains a refined choreography with several interactions.



A Call Choreography is a wrapper for a globally defined Choreography Task or Sub-Choreography. A call to a Sub-Choreography is marked with a symbol.

### Choreography Diagram



## Gateways



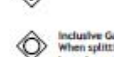
**Exclusive Gateway**  
When splitting, it routes the sequence flow to exactly one of the outgoing branches. When merging, it awaits one incoming branch to complete before triggering the outgoing flow.



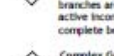
**Event-based Gateway**  
Is always followed by catching events or receive tasks. Sequence flow is routed to the subsequent event/task which happens first.



**Parallel Gateway**  
When used to split the sequence flow, all outgoing branches are activated simultaneously. When merging parallel branches it waits for all incoming branches to complete before triggering the outgoing flow.



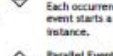
**Inclusive Gateway**  
When splitting, one or more branches are activated. All active incoming branches must complete before merging.



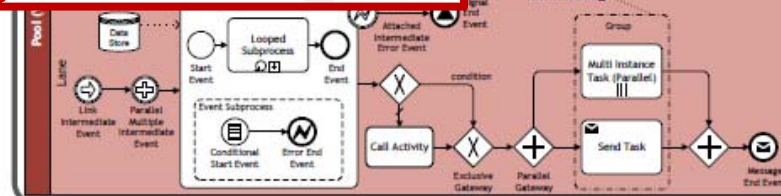
**Complex Gateway**  
Complex merging and branching behavior that is not captured by other gateways.



**Exclusive Event-based Gateway**  
Each occurrence of a subsequent event starts a new process instance.



**Parallel Event-based Gateway**  
The occurrence of all subsequent events starts a new process instance.

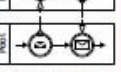


## Swimlanes



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



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

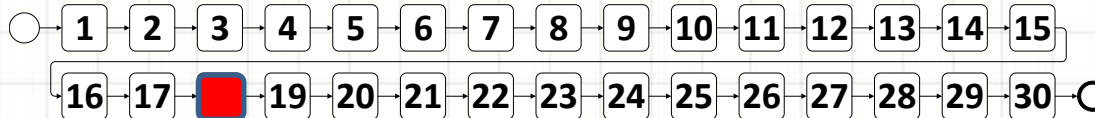
## Events

	Start	Intermediate	End
	Standard	Standard	Standard
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 throws 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

- A Data Object represents information flowing through the process, such as business documents, e-mails, or letters.
- A Collection Data Object represents a collection of information, e.g., a list of order items.
- A Data Input is an external input for the entire process. A kind of input parameter.
- A Data Output is data result of the entire process. A kind of output parameter.
- A Data Association is used to associate data elements to Activities, Processes and Global Tasks.
- A Data Store is a place where the process can read or write data, e.g., a database or a filing cabinet. It permits beyond the lifetime of the process instance.

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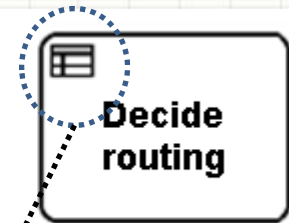
# Tâche BPMN 2.0 spéciale pour DMN 2/2

- Tâches standards :
- Tâche pour DMN :

User Task



Business Rule Task



Service Task

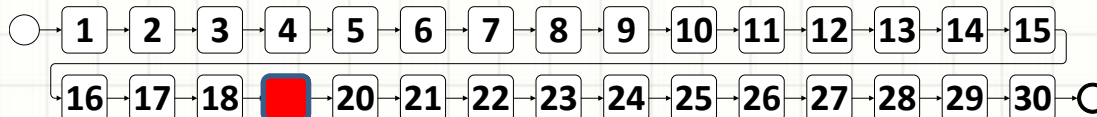


Script Task



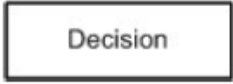
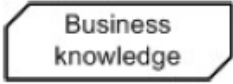
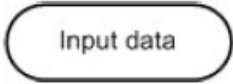
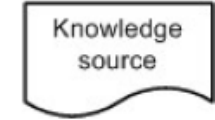


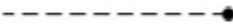
Table for decision  
(business-rule-driven)

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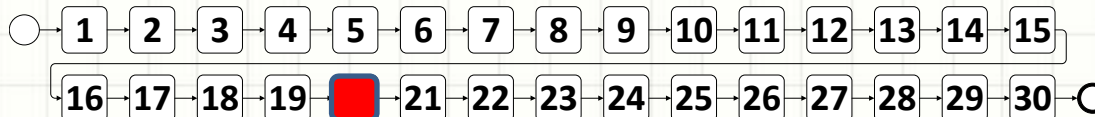


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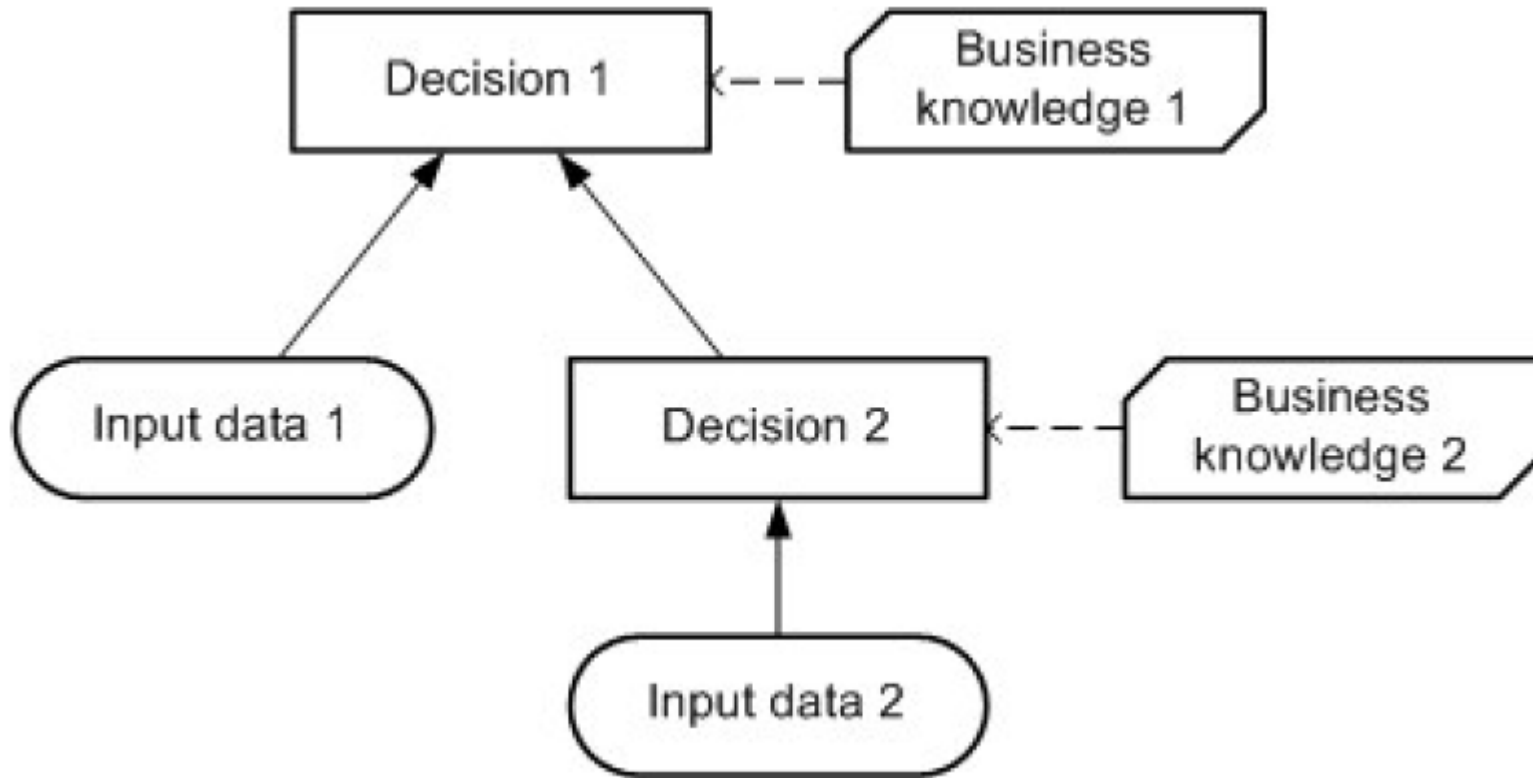
# Les composants graphiques de DMN 1/2

Component		Description	Notation
Elements	Decision	A decision denotes the act of determining an output from a number of inputs, using decision logic which may reference one or more business knowledge models.	
	Business Knowledge Model	A business knowledge model denotes a function encapsulating business knowledge, e.g. as business rules, a decision table, or an analytic model.	
	Input Data	An input data element denotes information used as an input by one or more decisions. When enclosed within a knowledge model, it denotes the parameters to the knowledge model.	
	Knowledge Source	A knowledge source denotes an authority for a business knowledge model or decision.	
Requirements	Information Requirement	An information requirement denotes input data or a decision output being used as one of the inputs of a decision	
	Knowledge Requirement	A knowledge requirement denotes the invocation of a business knowledge model	
	Authority Requirement	An authority requirement denotes the dependence of a DRD element on a knowledge source, or the dependence of a knowledge source on input data	

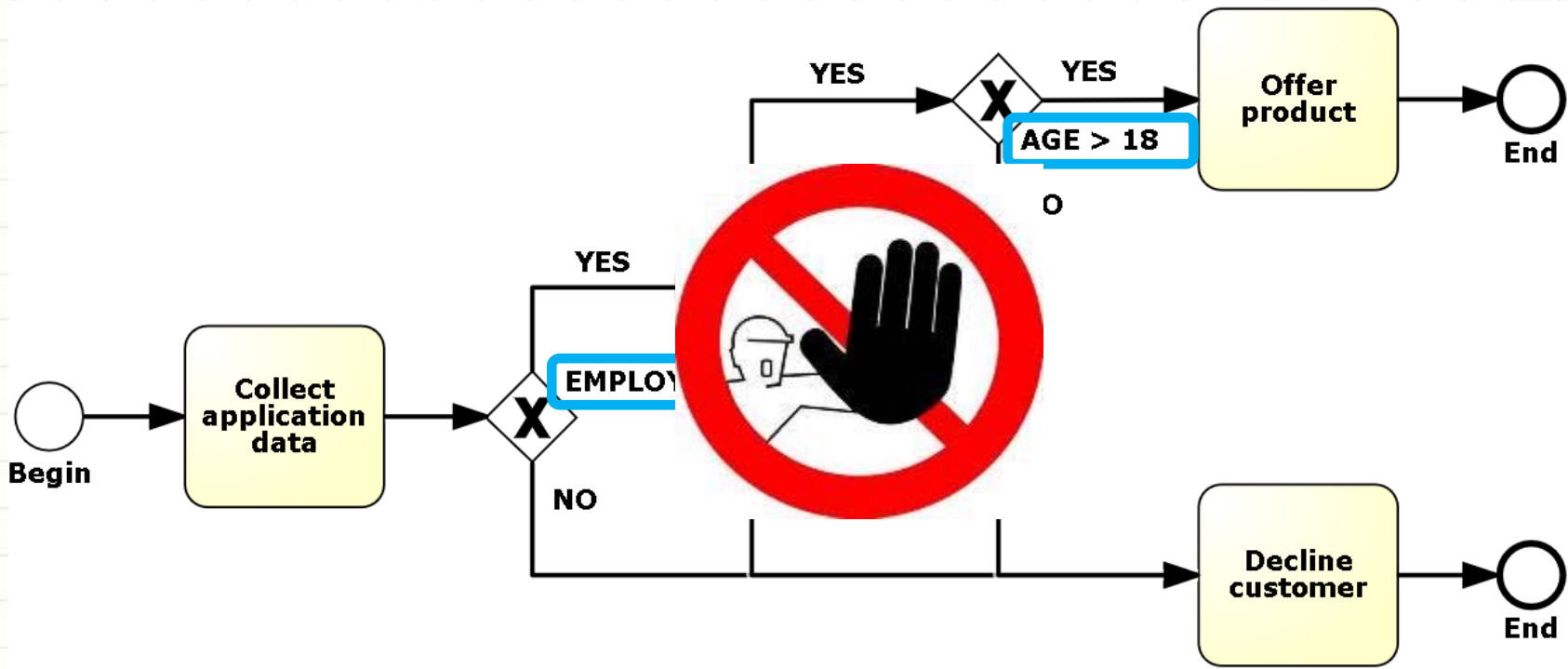
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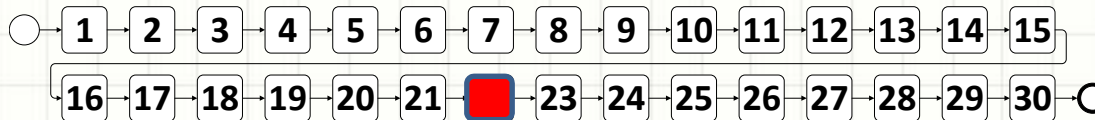
# Exemple de graphe DMN simple 2/2



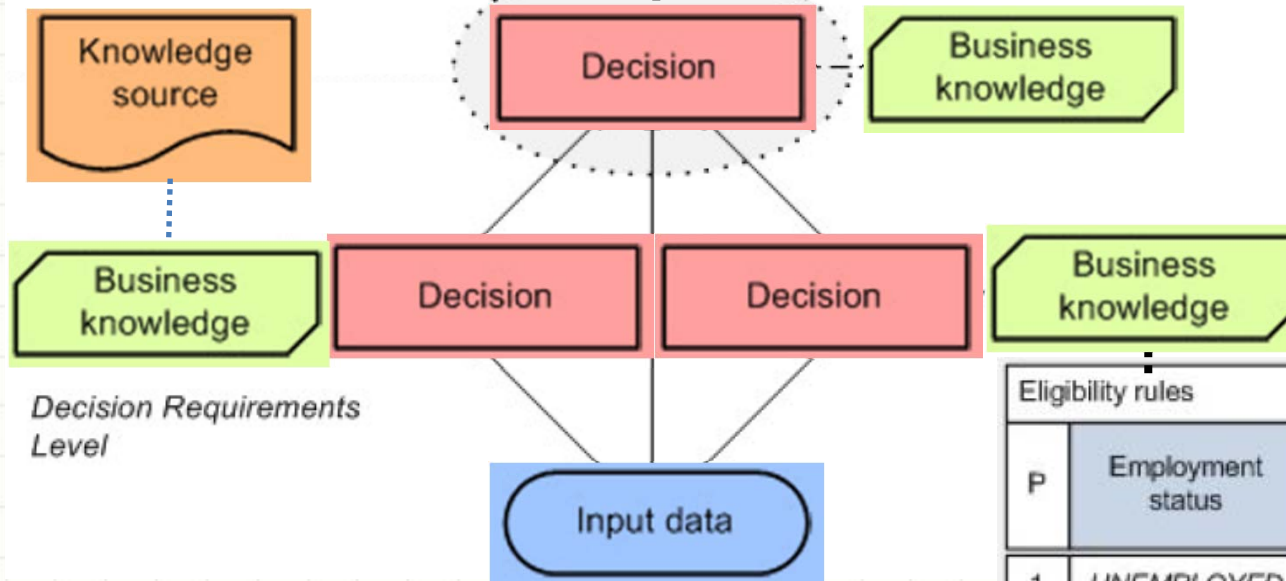
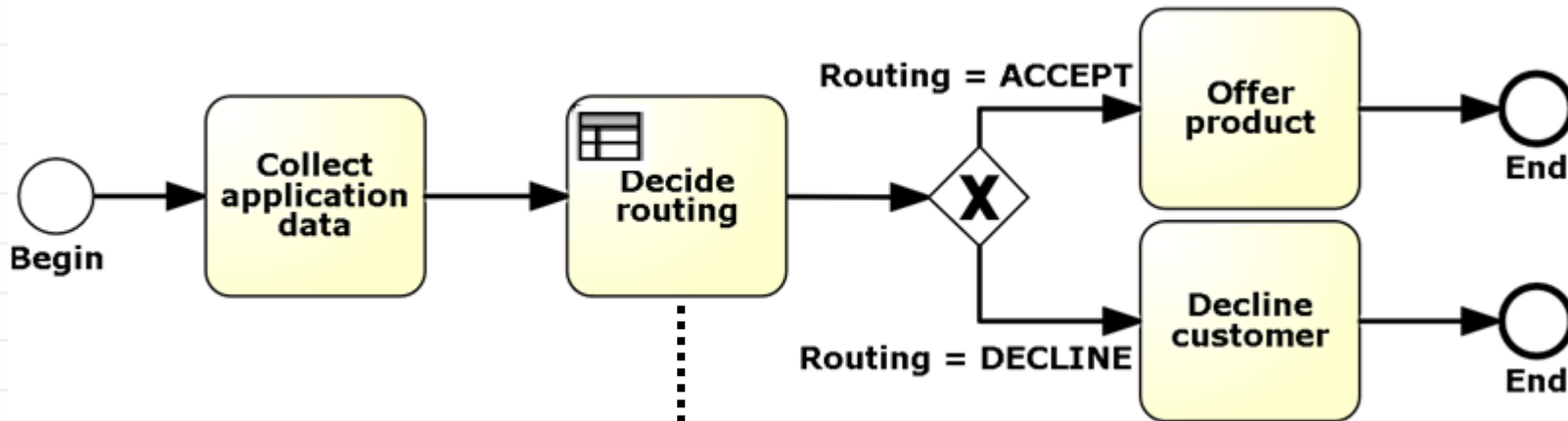
# Modélisation de processus avec BPMN sans DMN



Collaboration Diagram (BPMN)



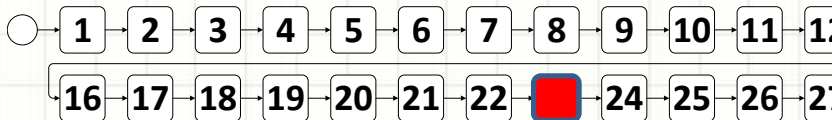
# Modélisation processus BPMN & DMN



**Decision Requirements Graph (DMN)**

Eligibility rules				
P	Employment status	Country	Age	Eligibility
				INELIGIBLE, ELIGIBLE
1	UNEMPLOYED	-	-	INELIGIBLE
2	-	not(UK)	-	INELIGIBLE
3	-	-	< 18	INELIGIBLE
4	-	-	-	ELIGIBLE

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# Expressions S-FEEL & Langage FEEL

FEEL étend les objets JSON (sic).

FEEL est inspiré de : Java, JavaScript, XPath, SQL, PMML, Lisp.

Eligibility rules	
Employment status	Application.Applicant.Employment.Status
Country	Application.Applicant.Country
Age	Application.Date - Application.Applicant.Date of birth

Boxed Expression  
(Invocation)

Eligibility rules				
P	Employment status	Country	Age	Eligibility
				INELIGIBLE, ELIGIBLE
1	UNEMPLOYED	-	-	INELIGIBLE
2	-	not(UK)	-	INELIGIBLE
3	-	-	< 18	INELIGIBLE
4	-	-	-	ELIGIBLE

Boxed Expression  
(Decision Table)

FEEL(

decision table(

inputs: [Employment status, Country, Age],

outputs: [Eligibility],

rules: [[UNEMPLOYED, -, -, INELIGIBLE],

[-, not(UK), -, INELIGIBLE],

[-, -, <18, INELIGIBLE],

[-, -, -, ELIGIBLE],

hit policy: P.completeness: C))

FEEL(

Eligibility rules(

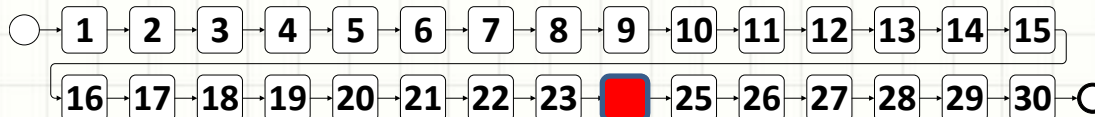
Application.Applicant.Employment.Status,

Application.Applicant.Address.Country,

Application.Date -

Application.Applicant.DateOfBirth))

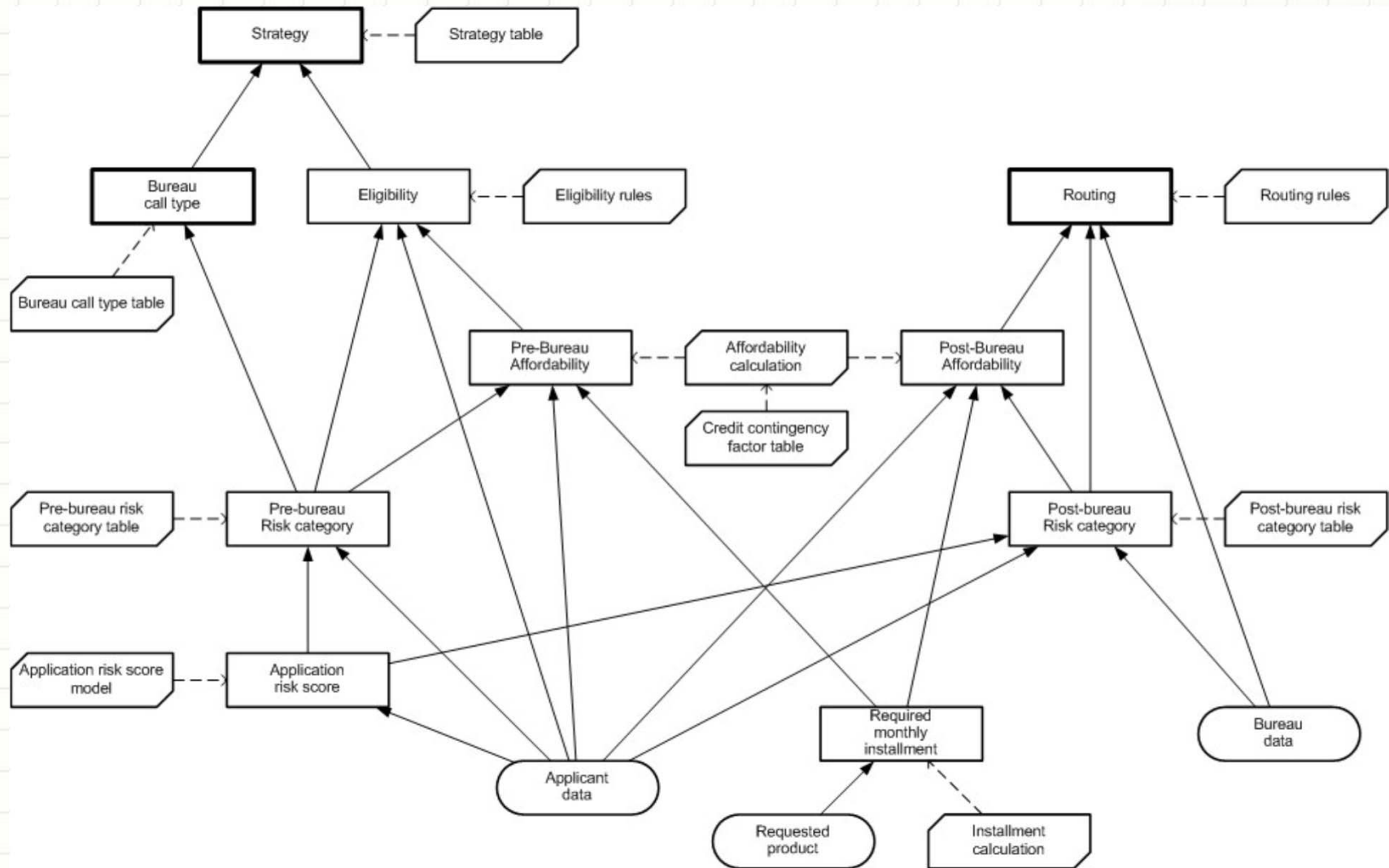
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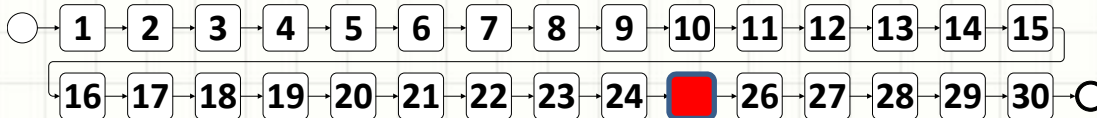
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# Exemple de graphe DMN complexe

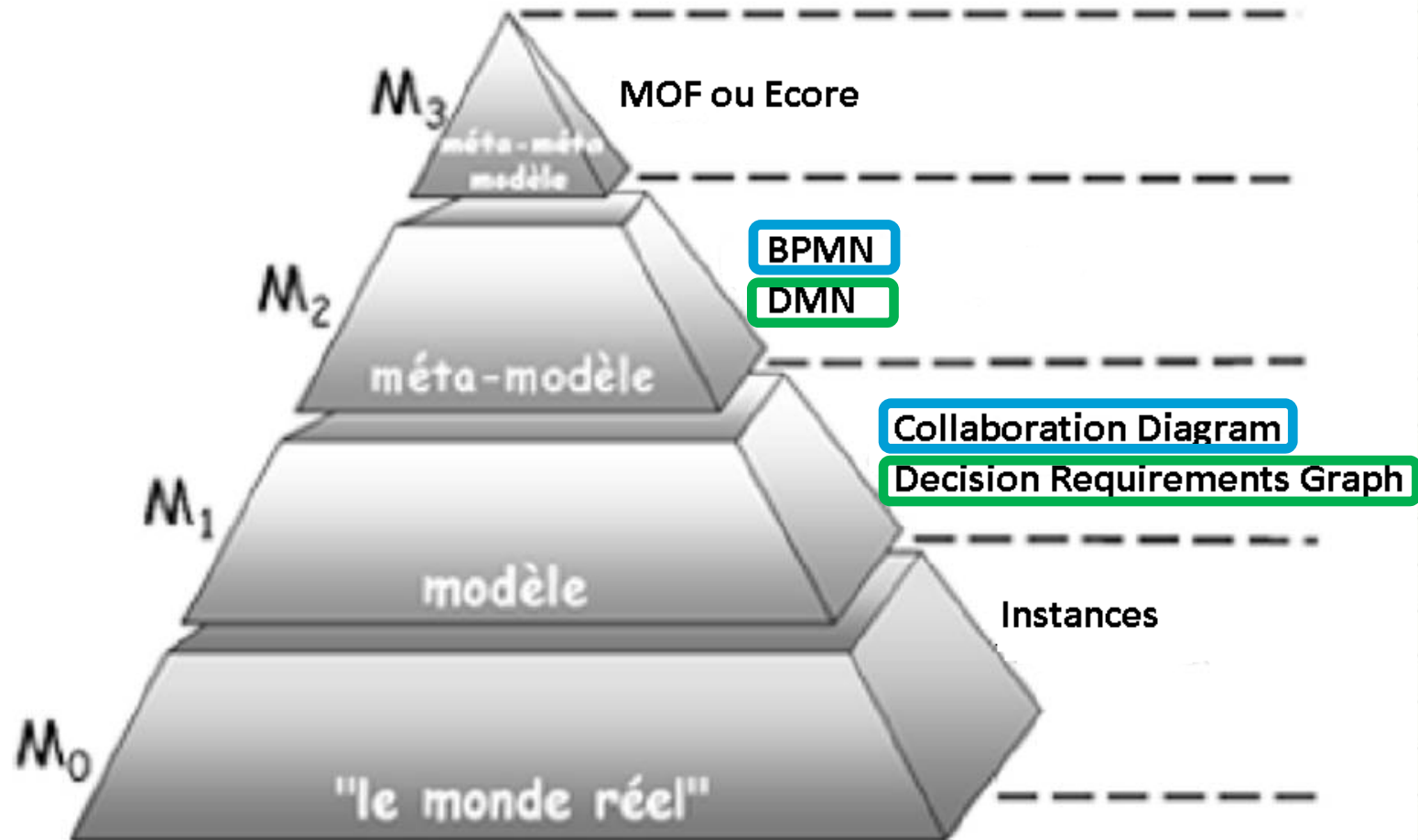


AMBESAS

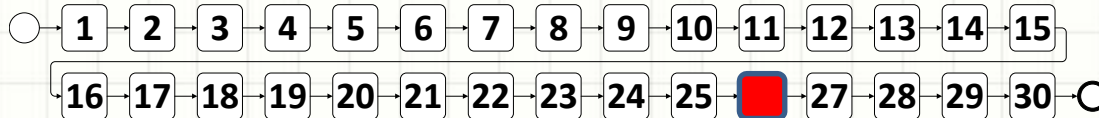


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# Pyramide de modélisation de l'OMG 1/3

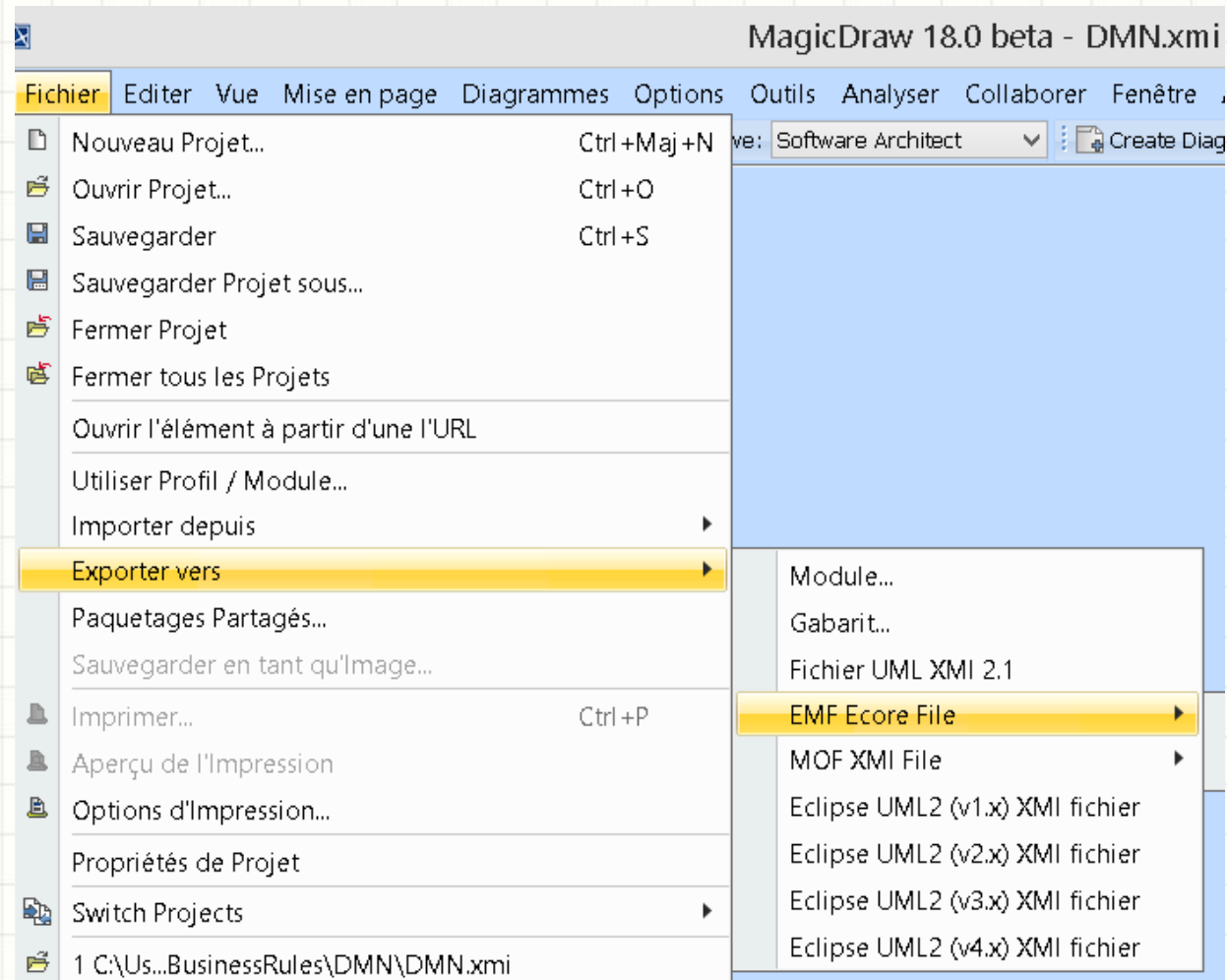


AMBESAS

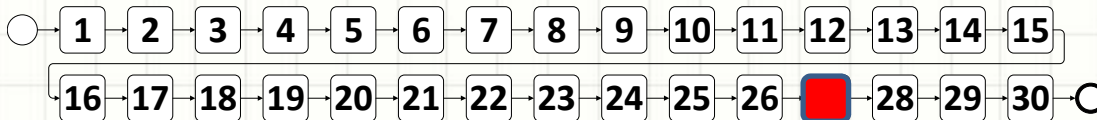


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# Transformation de métamodèle 2/3



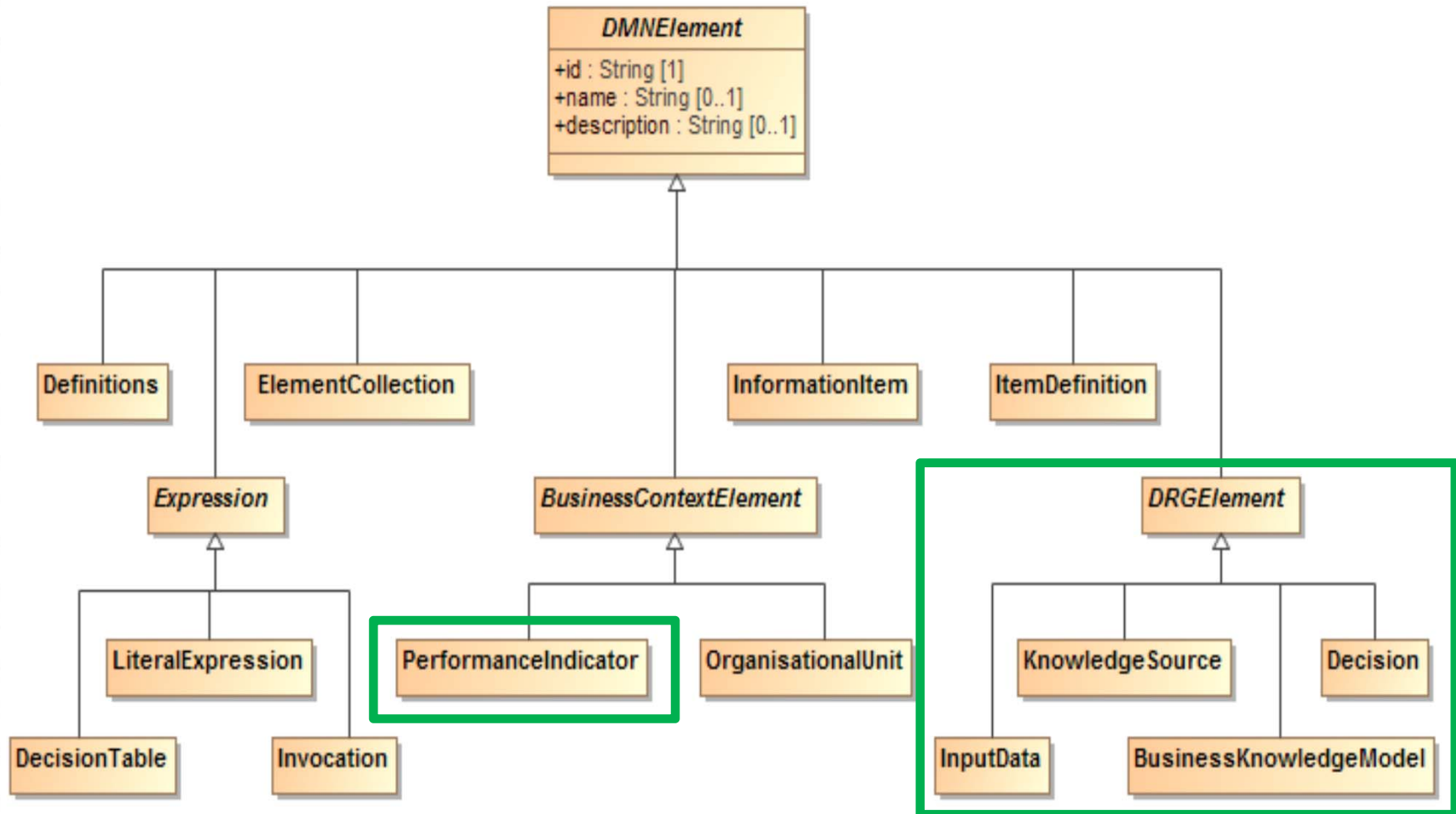
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# Métamodèle DMN (simplifié) 3/3

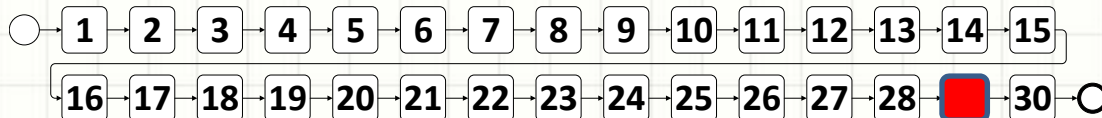




# Perspectives & Conclusion provisoire

- Conversion Model-to-Text (DRG vers FEEL)
- Conversion vers le PSM (Platform Specific Model) d'un BRMS (Business Rules Management System)
- “In theory, there is no difference between theory and practice.  
But, in practice, there is.”

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# Merci de votre attention

## Vos questions ?



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