

AUTOMATISATION DE PROCESSUS D'AFFAIRES

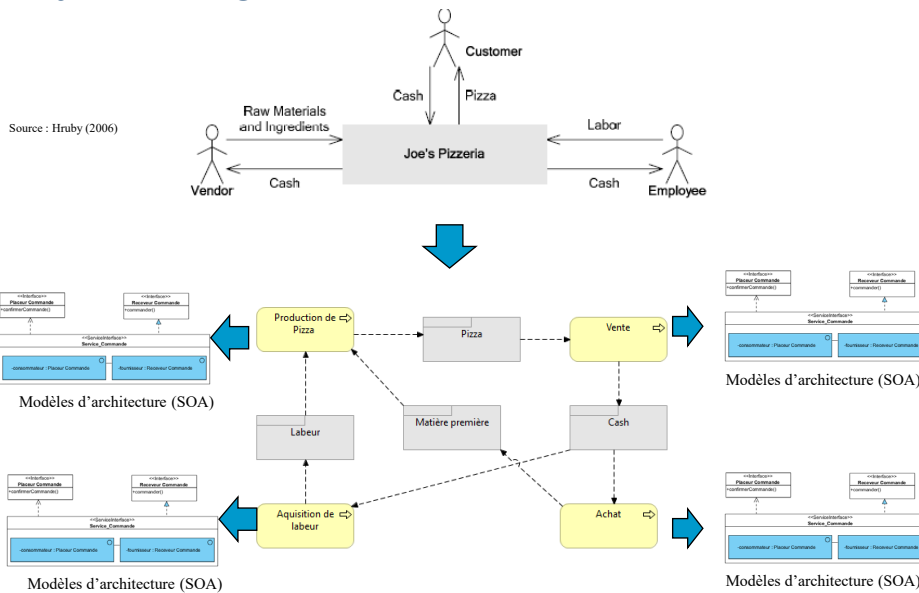
A. Leshob



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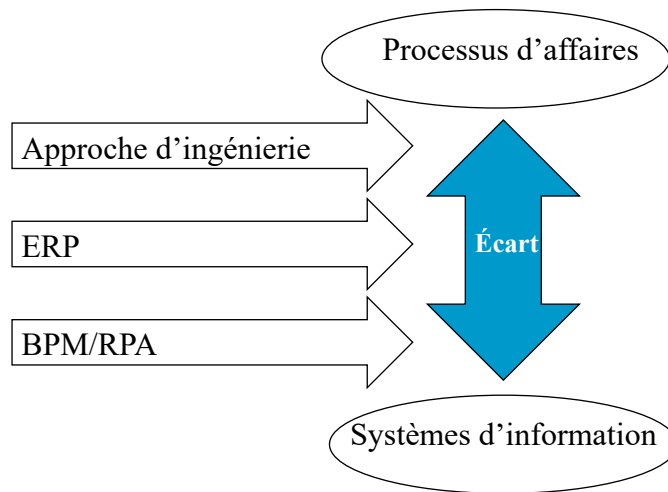
Objectif long terme



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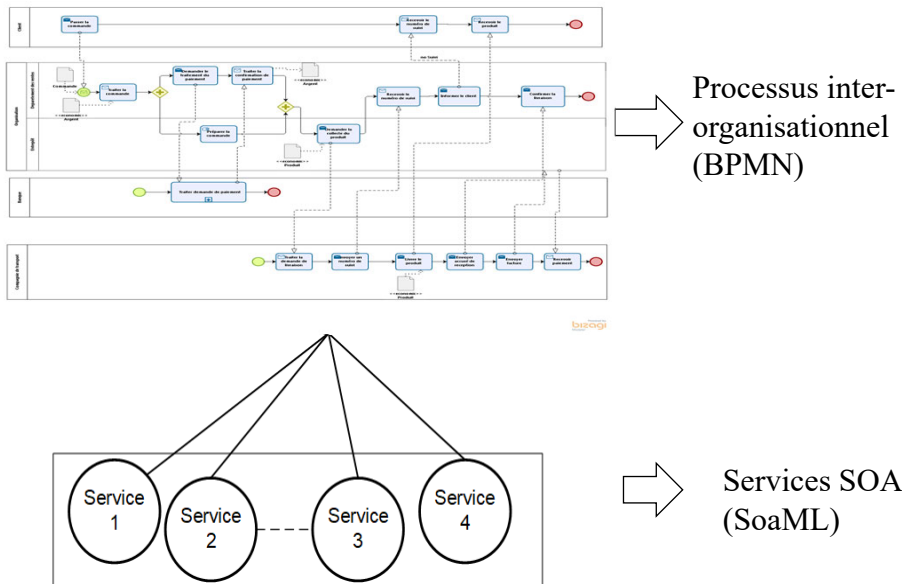
Du processus vers le système



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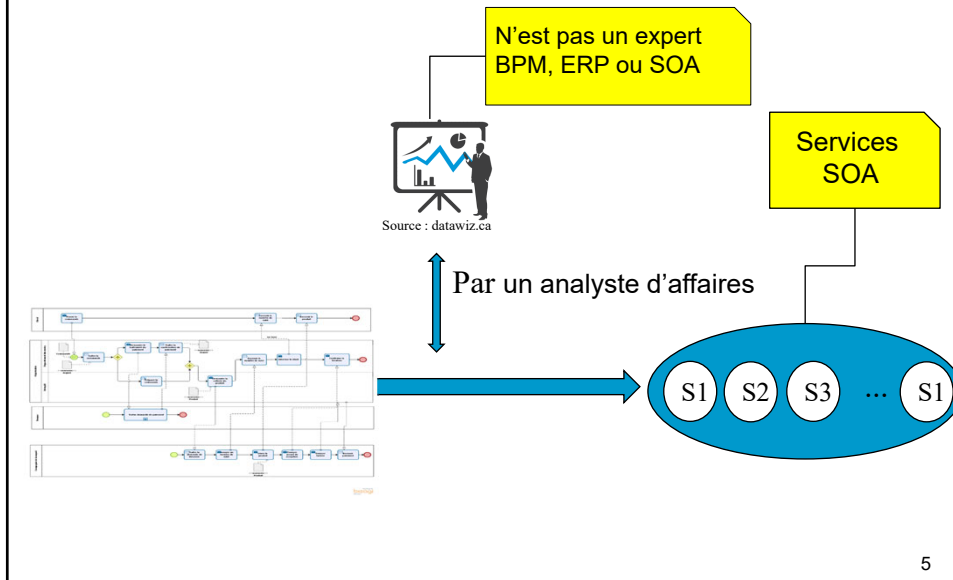
Notre objectif



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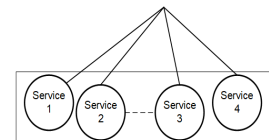
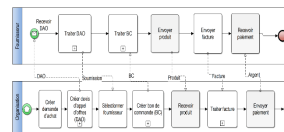
Notre objectif



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Questions de recherche

1. Comment obtenir un modèle de processus d'affaires précis ?
2. Comment obtenir (identifier et spécifier) des services SOA à partir d'un modèle de processus d'affaires ?



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Mais qu'est-ce qu'un processus d'affaires ?

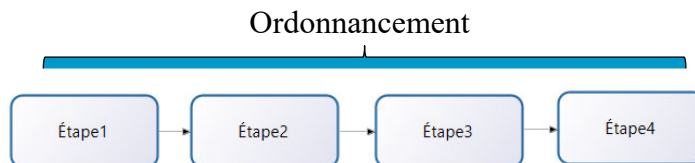
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Qu'est-ce qu'un processus d'affaires

- Un processus d'affaires est un ensemble d'activités **structurées** conçues pour produire un **résultat de valeur** pour un client ou un marché

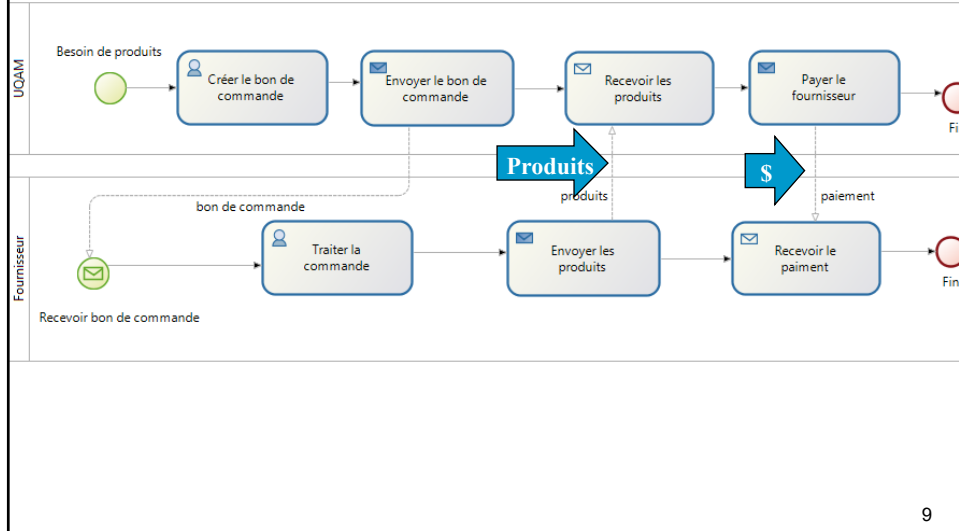
Devenport (1993)



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Processus d'achat



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Une approche générique

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Comment concevoir une approche générique?

Besoin de trouver un (des) point(s) commun(s) entre les processus



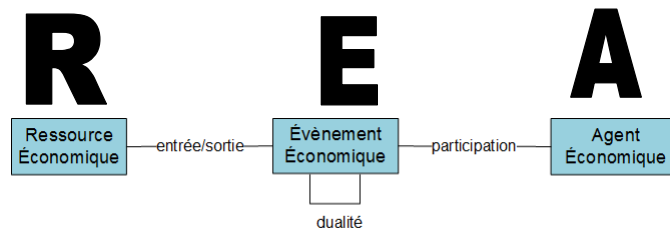
Ontologie REA



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Ontologie REA



Cookie Monster Elmo



(Source : McCarthy, 2004)

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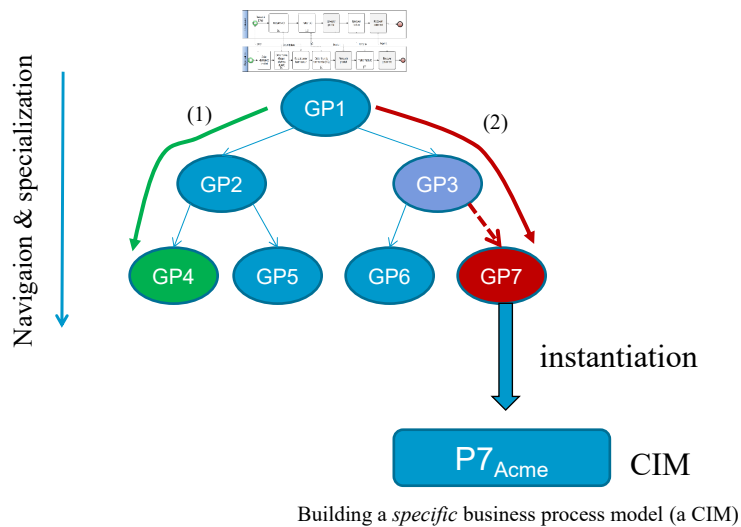
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QR1 :
 Comment obtenir un modèle de processus d'affaires précis ?

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A partir d'un catalogue de processus

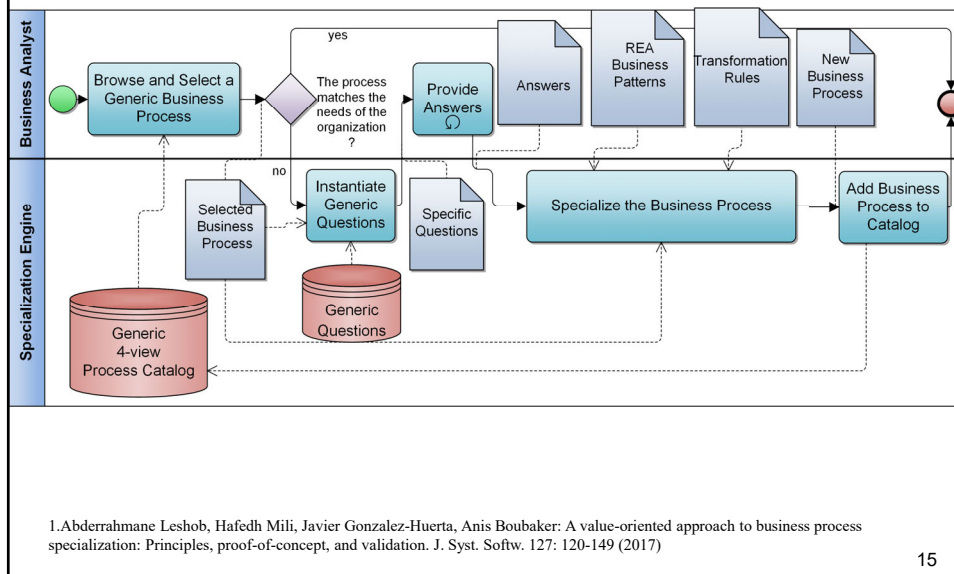


1. Abderrahmane Leshob, Hafedh Mili, Javier Gonzalez-Huerta, Anis Boubaker: A value-oriented approach to business process specialization: Principles, proof-of-concept, and validation. J. Syst. Softw. 127: 120-149 (2017)

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Processus de spécialisation



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Exemples de patrons d'affaires

- 1. Patron d'échange :** Échange de ressources entre deux partenaires



Source : <https://africansinpoland.org/>

- 2. Patron de contrat :** un accord entre deux ou plusieurs parties



Source : <http://doecollab.com/>

- 3. Le patron de créance :** Déséquilibre au niveau des ressources



Source : latribune.fr

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Le patron contrat

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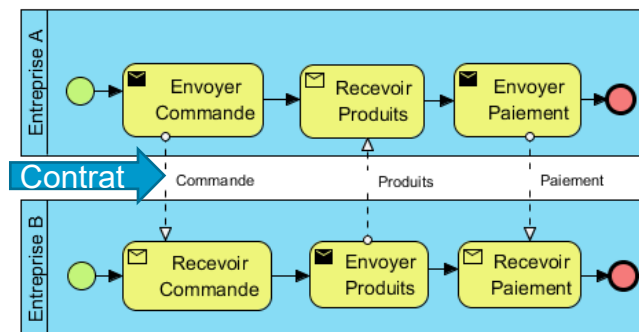
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Patron Contrat



Source : west-legal.ca

- Un contrat = un accord entre deux ou plusieurs parties
 - Exemple : Le bon de commande dans un processus d'approvisionnement est un contrat entre l'organisation et le fournisseur

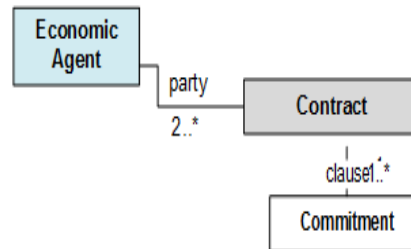


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Modélisation du contrat

- Un contrat = un accord entre deux ou plusieurs parties



- Un contrat contient des engagements
 - Les lignes du bon de commande sont des engagements

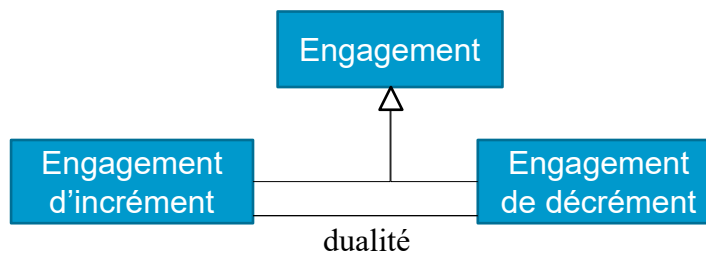
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L'engagement



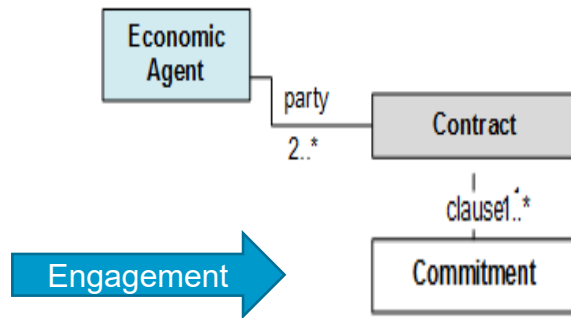
- Les lignes du bon de commande sont des engagements:
 1. les lignes d'achat : engagements pour recevoir
 2. et les lignes de paiement : engagements de payer



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Modélisation du contrat

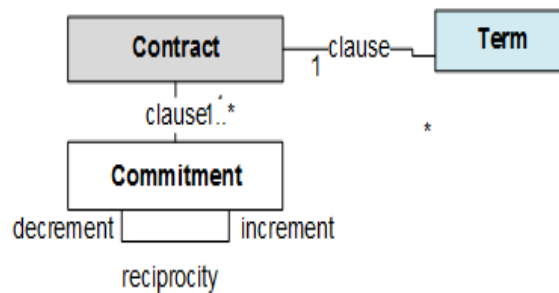


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Les termes

- Termes = obligations spéciales à exécuter sous certaines conditions
 - Par ex., pénalités à appliquer en cas :
 - d'annulation
 - ou de violation des engagements



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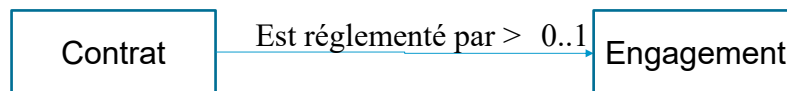
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L'accord économique (Agreement)

- Réglemente les contrats individuels

- Par ex.,

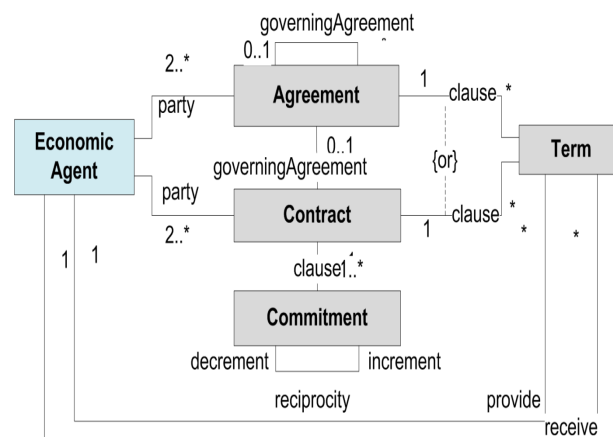
- contrat en quantité (1000 item/ans pendant 5 ans)
 - contrat en valeur (1 M\$ pendant 5 ans)



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Patron contrat

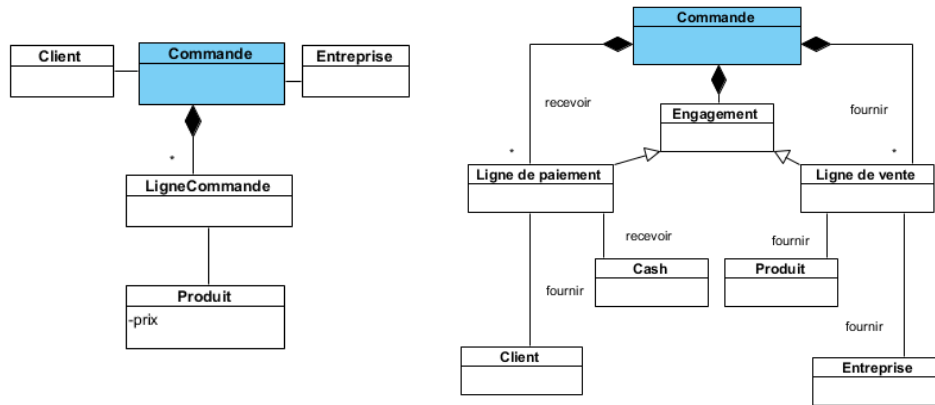


Le patron contrat (Hruby, 2006)

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Structure d'une commande

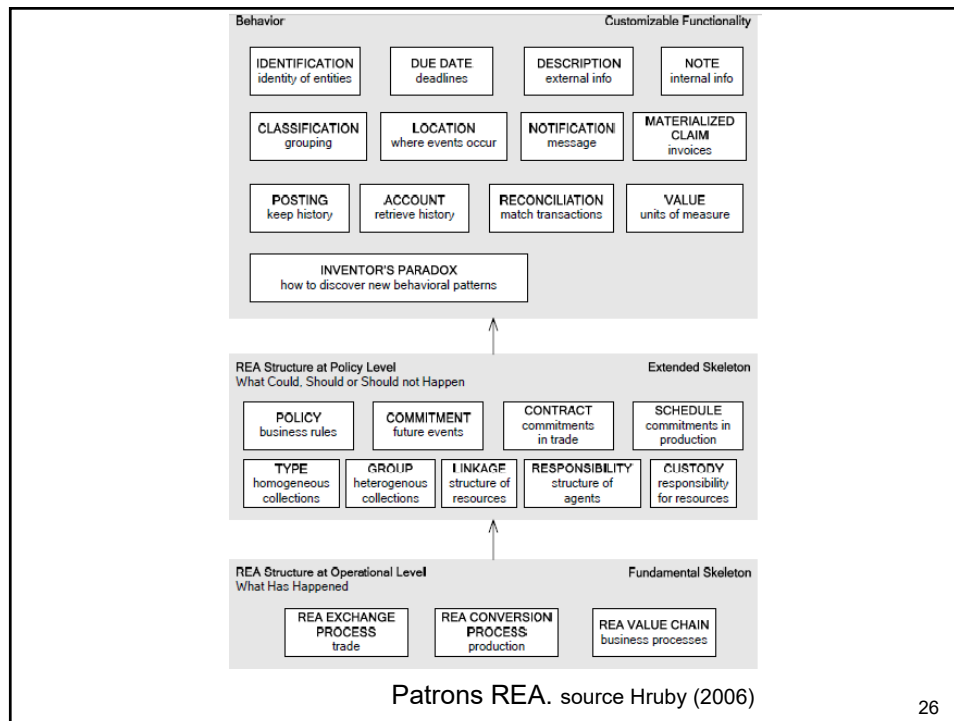


Modélisation classique

Modélisation REA

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Patrons REA. source Hruby (2006)

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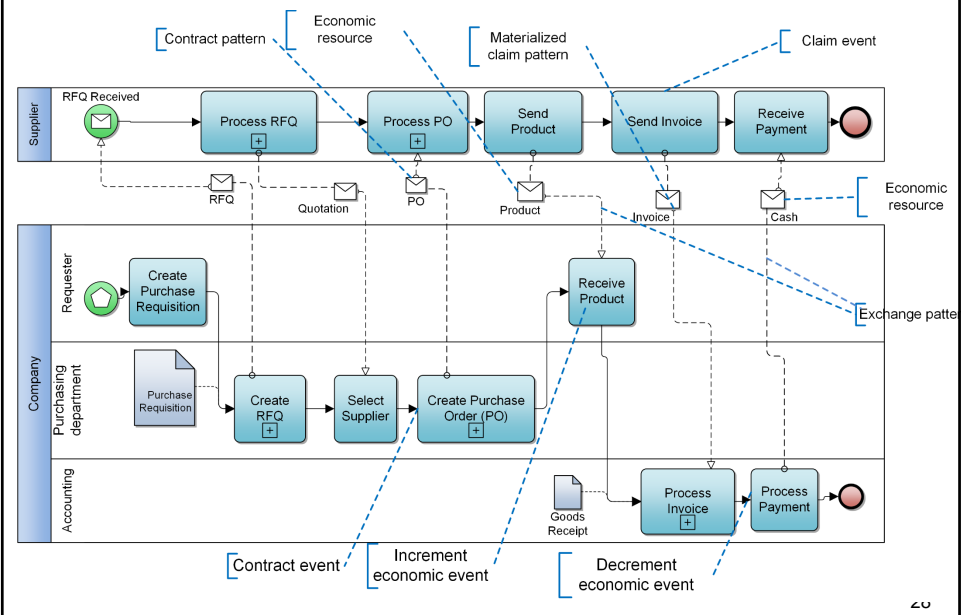
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Exemple de spécialisation de processus

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Processus d'approvisionnement

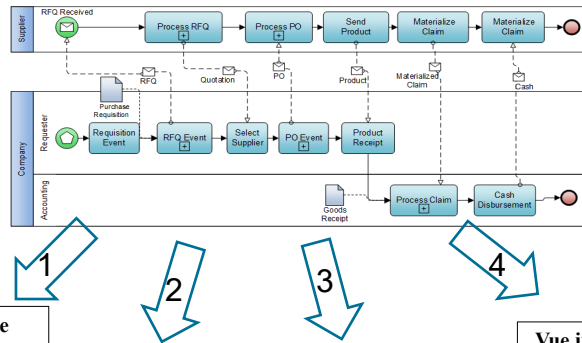


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Vues de processus

- Un modèle de processus est composé de 4 vues (curtis, 1992)



Vue Fonctionnelle

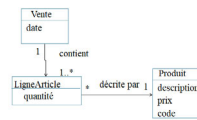
- Activités à accomplir
- Ressources produites et consommées par ces activités

- ## Vue dynamique
- quand et comment les activités sont connectées

- ## Vue organisationnelle
- Rôles dans le processus
 - Mécanismes d'échange

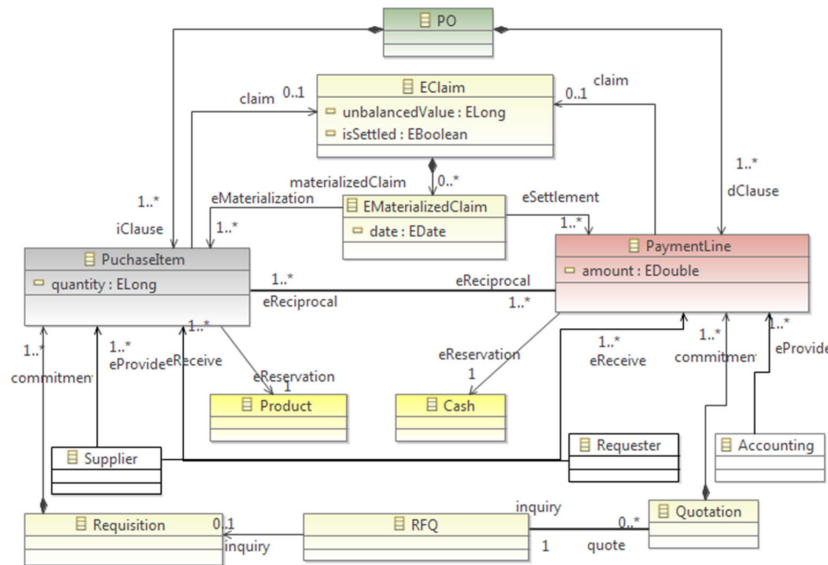
Vue informationnelle

- structure des entités



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Exemple : Vue informationnelle



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Exemple : Question de spécialisation

```

<!------->
<!-- The agreement question (Contract pattern) -->
<!------->
<question id="q4">
  <name>AGREEMENT_IN_THE_PROCESS</name>
  <description>
    Contract regulates the behavior among organizations and individuals.
    A contract is an entity containing commitments and terms. Agreement
    is a higher level contract that regulates the behavior of individual
    contracts. SLA is an example of agreement.
  </description>
  <core answerType="AnswerType.BOOLEAN">
    Is there an agreement that governs the business process {0}?
  </core>
  <parameters >
    <parameter>Process</parameter>
  </parameters>
</question>

```

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```

1 rule 'AGREEMENT IN THE PROCESS-INFORMATIONAL VIEW'
2 ruleflow-group 'Informational_E -'
3 when
4   $q: Question(answer.value=='true', genericQuestion.name==GQuestions.
      AGREEMENT_IN_THE_PROCESS);
5 then
6   # Identify REA economic agents
7   Message m = DynaHandler.getREAContractMessage(bProcess, $q.param(0));
8   Agent agent1 = (Agent) m.getSourcePart();
9   Agent agent2 = (Agent) m.getTargetPart();
10  # 1. Add the agreement structure according to the REA contract pattern
11  # 1.1. Create Agreement class and add attributes to it
12  EClass clazz=InfHandler.addClass(view,AGREEMENT_CLASS, BpPackage.
      eINSTANCE.getEResource());
13  InfHandler.addAttribute(clazz, 'dateFrom', eINSTANCE.getEDate());
14  InfHandler.addAttribute(clazz, 'dateTo', eINSTANCE.getEDate());
15  ...
16
17  # 1.2. Add references between the agreement and agents classes
18  # 1.2.1. Add references between the agreement and the agent1 classes
19  EReference ref1=InfHandler.addEReference(view,clazz,agent1, agent1.
      toLowerCase(),1,1,null, false);
20  InfHandler.addEReference(view,agent1,clazz,AGREEMENT_CLASS.toLowerCase()
      (),1
      , ETypedElement.UNBOUNDED_MULTIPLICITY,ref1,
      false);
21
22  # 1.2.2. Add references between the agreement and the agent2 classes
23  ...
24
25  # 1.2.2. Add bidirectional references between the agreement class and
      the contract class
26  EReference ref3 = EMFInfViewHandler.addEReference(view, clazz, m.
      getResource(),"contract"
      , 0, ETypedElement.UNBOUNDED_MULTIPLICITY,
      null, false);
27
28
29
30  # 2. Remove the classes that are used to identify the exchange partner
31  InfHandler.removeElementsByEventType(bProcess, $q.param(0),'
      REA AgentIdentification');
32 end

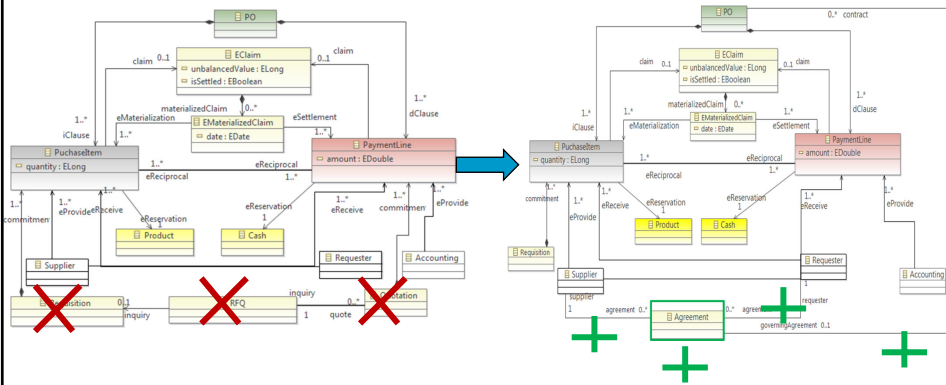
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Règle de transformation de la vue informationnelle en cas de réponse positive à la question du contrat

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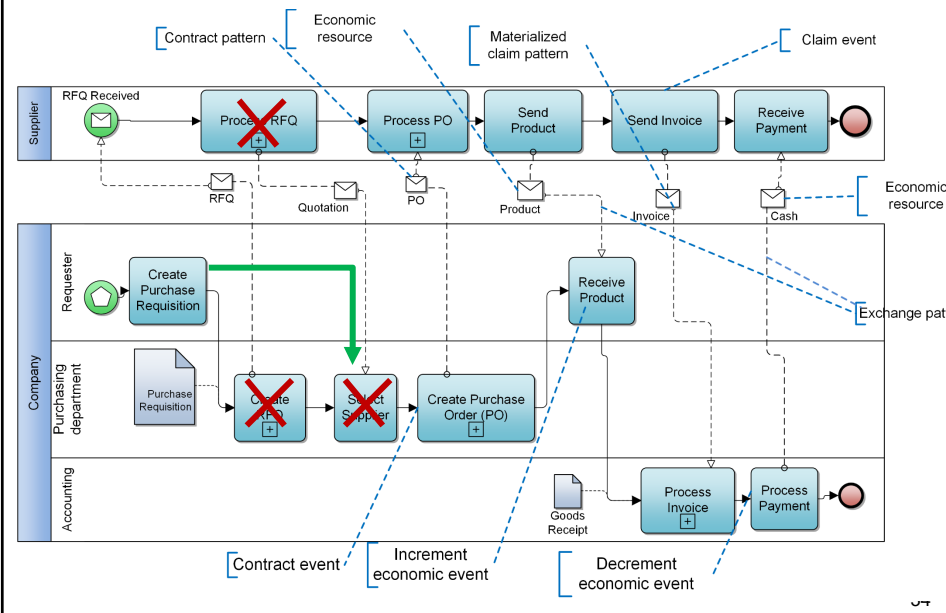
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Transformation de la vue informationnelle

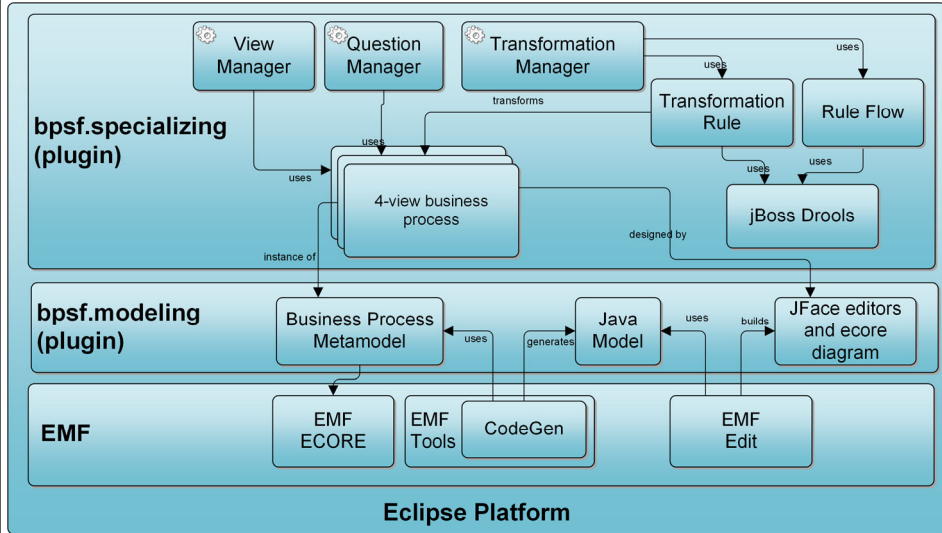


Transformation de la vue informationnelle en cas de réponse positive à la question du contrat

Transformation de la vue dynamique



Prototype



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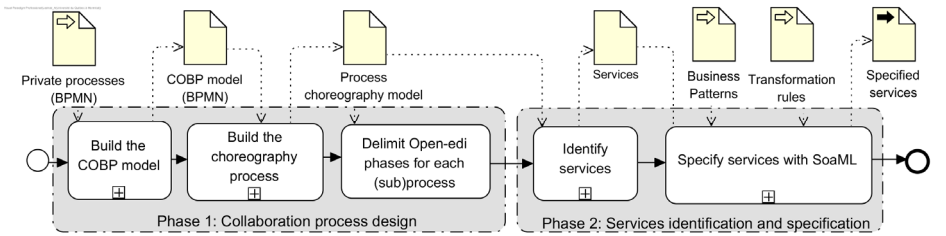
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QR2 :
Comment obtenir des services SOA à
partir d'un modèle de processus
d'affaires ?

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Approche

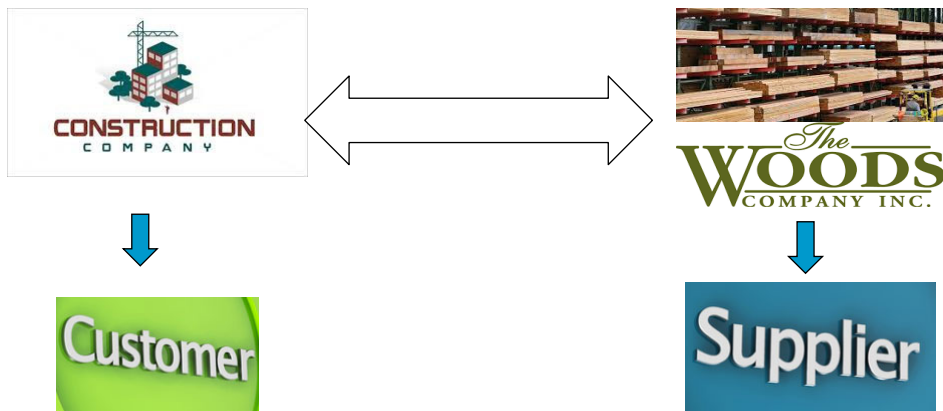


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Exemple

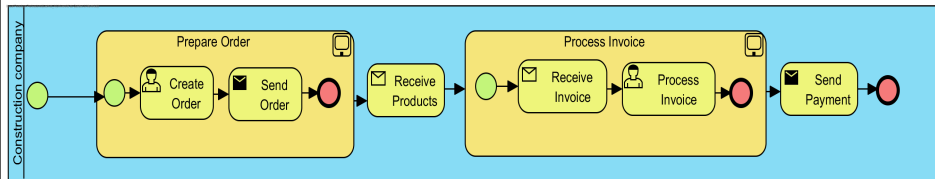
- Deux entreprises qui veulent collaborer



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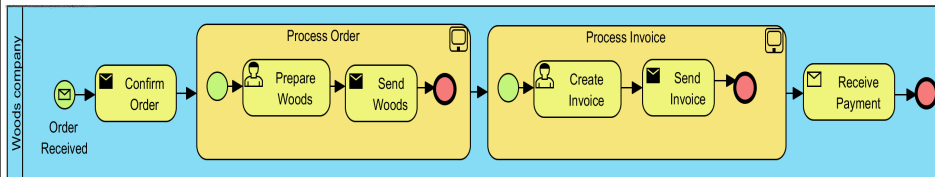
Procurement Process



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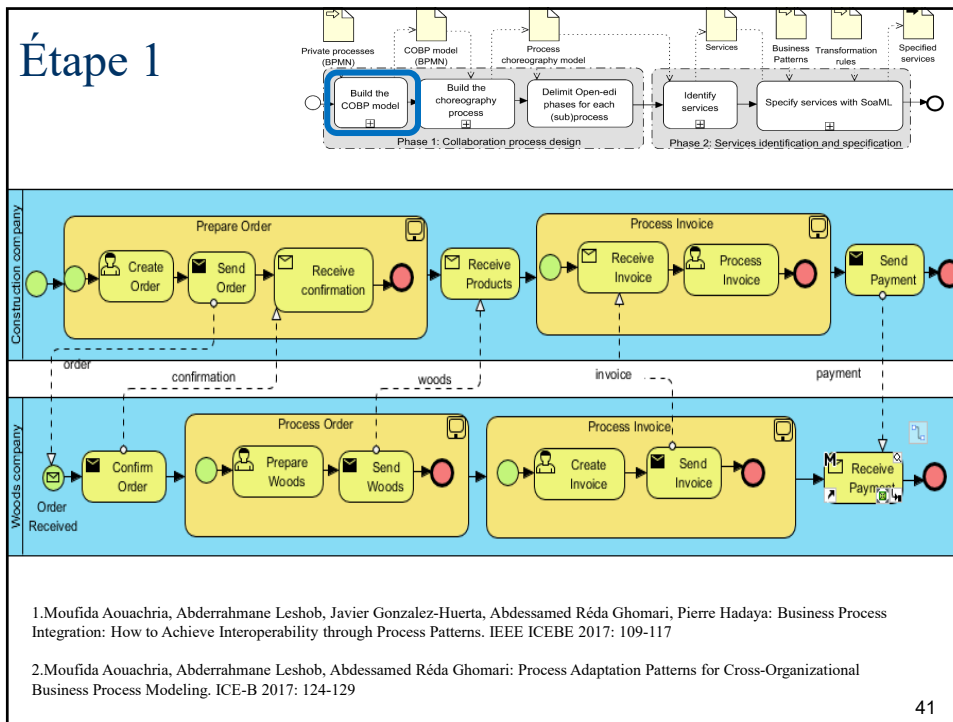
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S&D process



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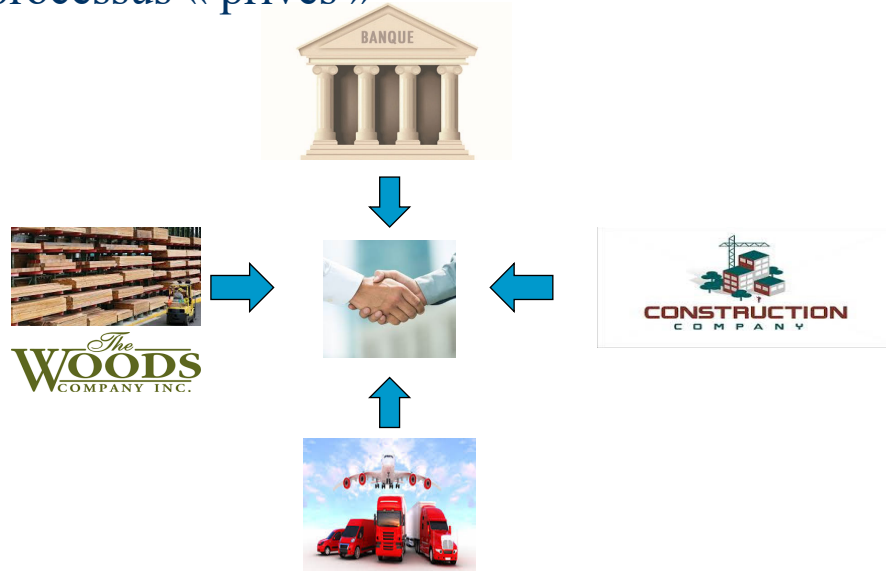
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Dans un contexte plus général

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Les organisations collaborent à travers leur processus « privés »



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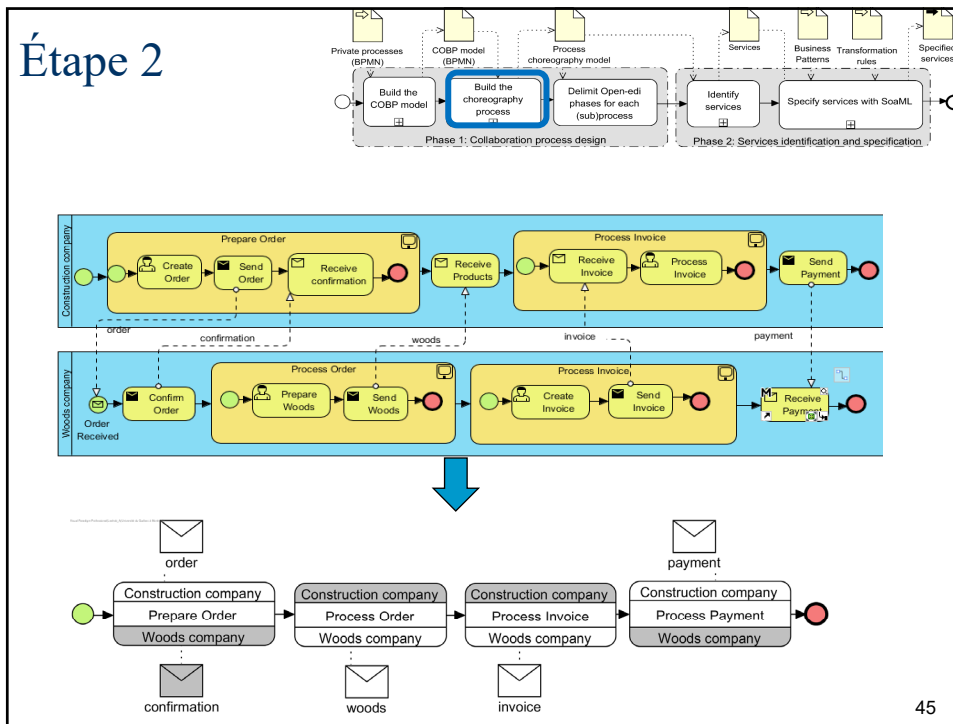
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Les organisations collaborent à travers un process inter-organisationnel (COBP)

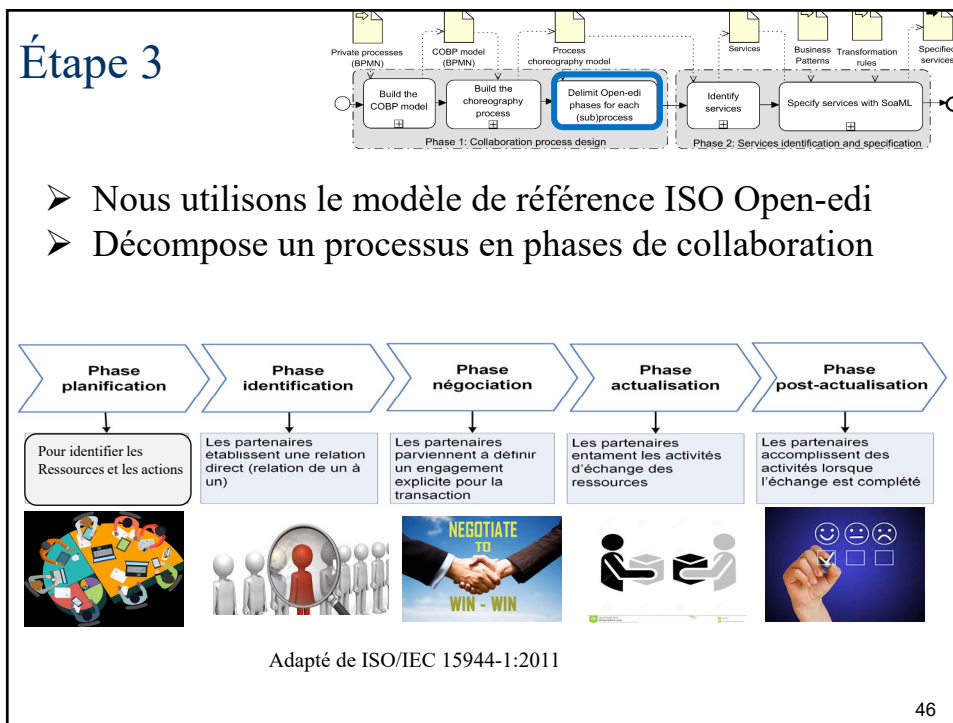


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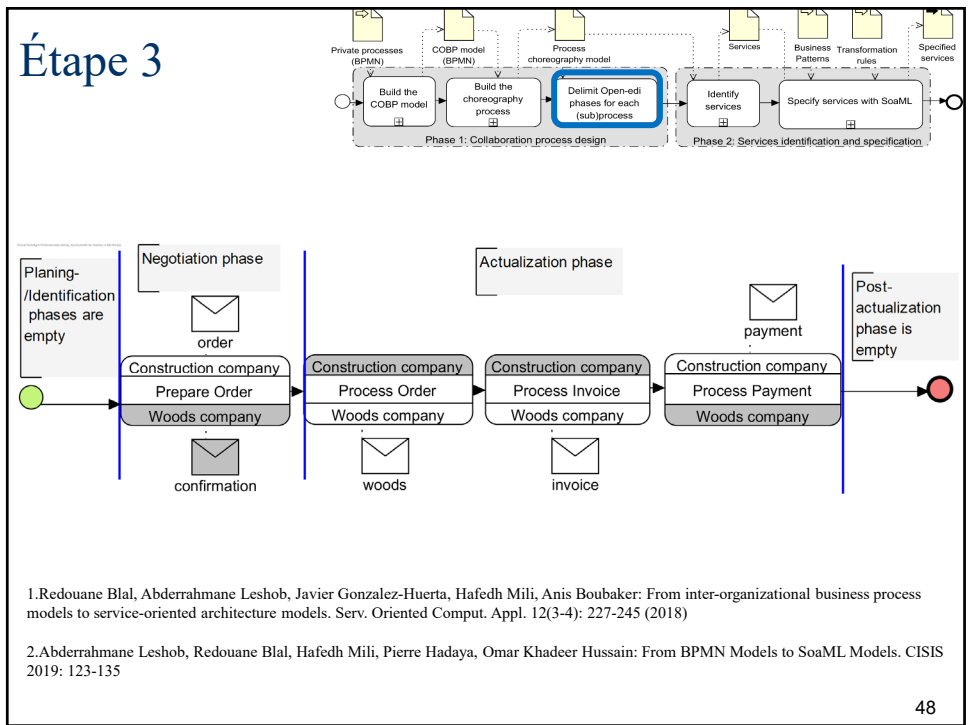
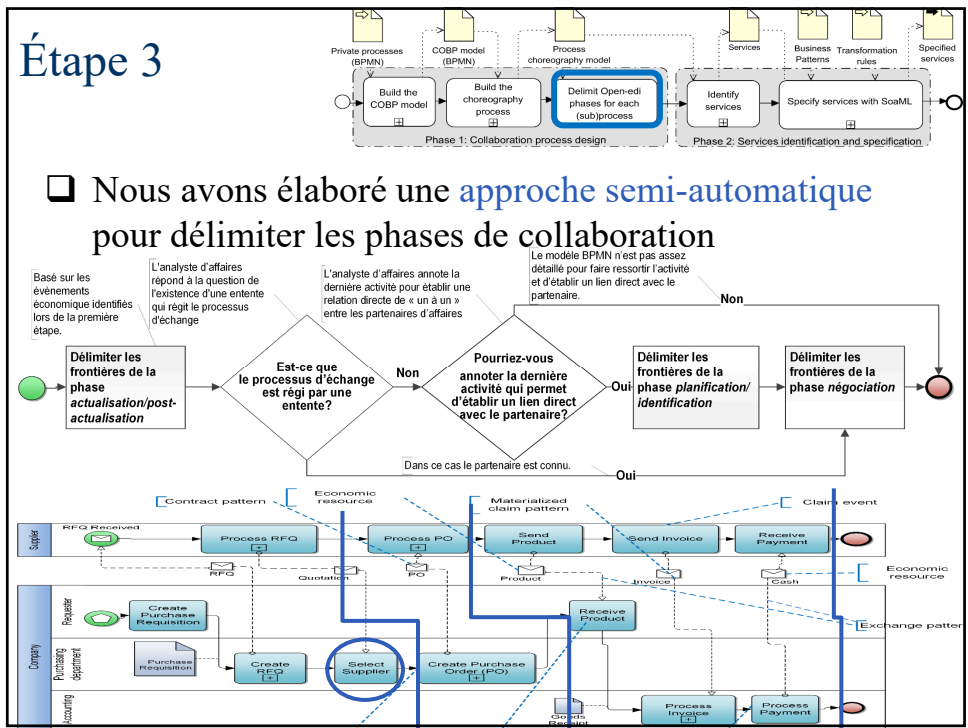
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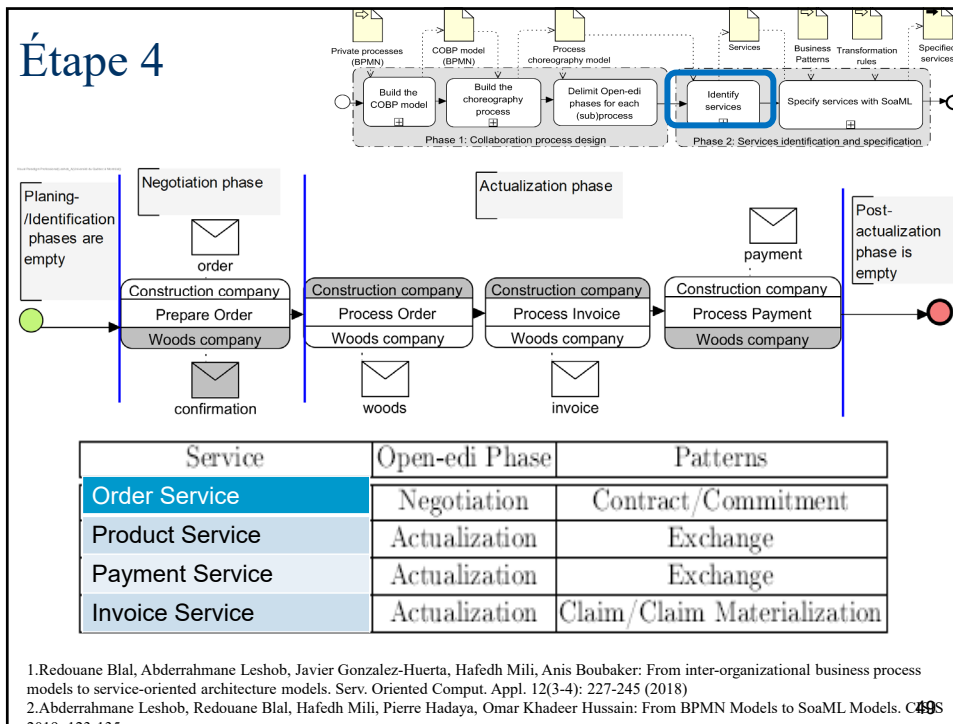


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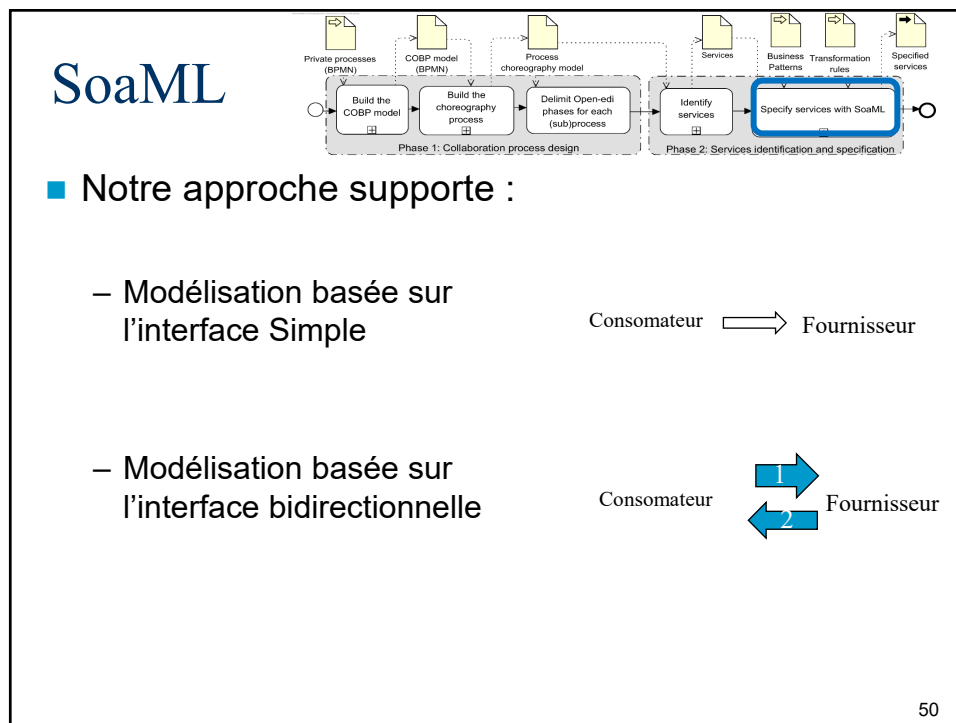


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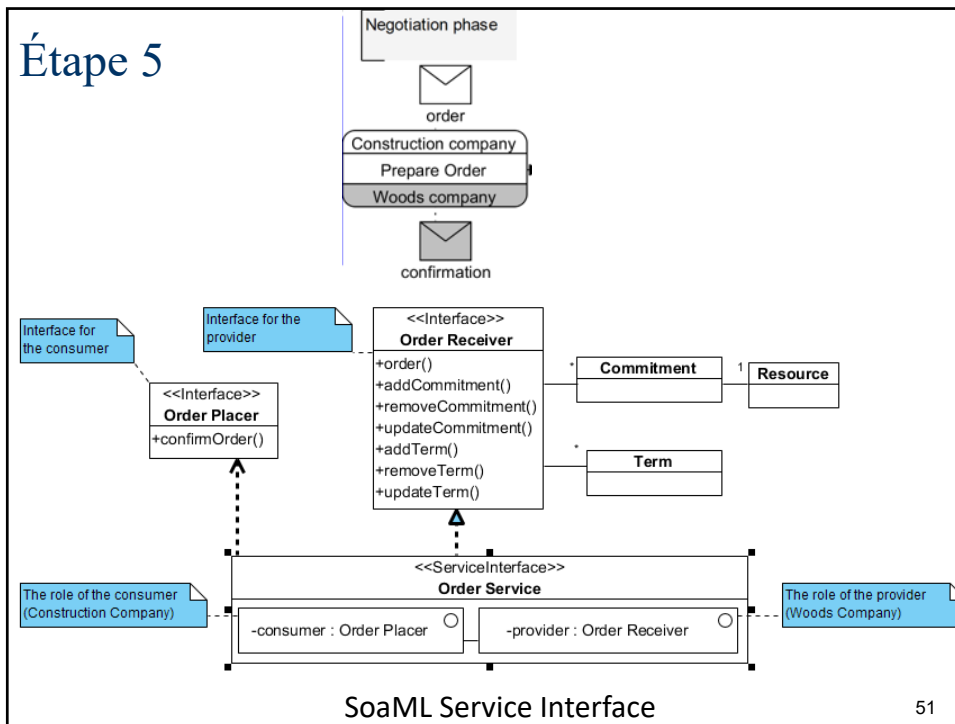




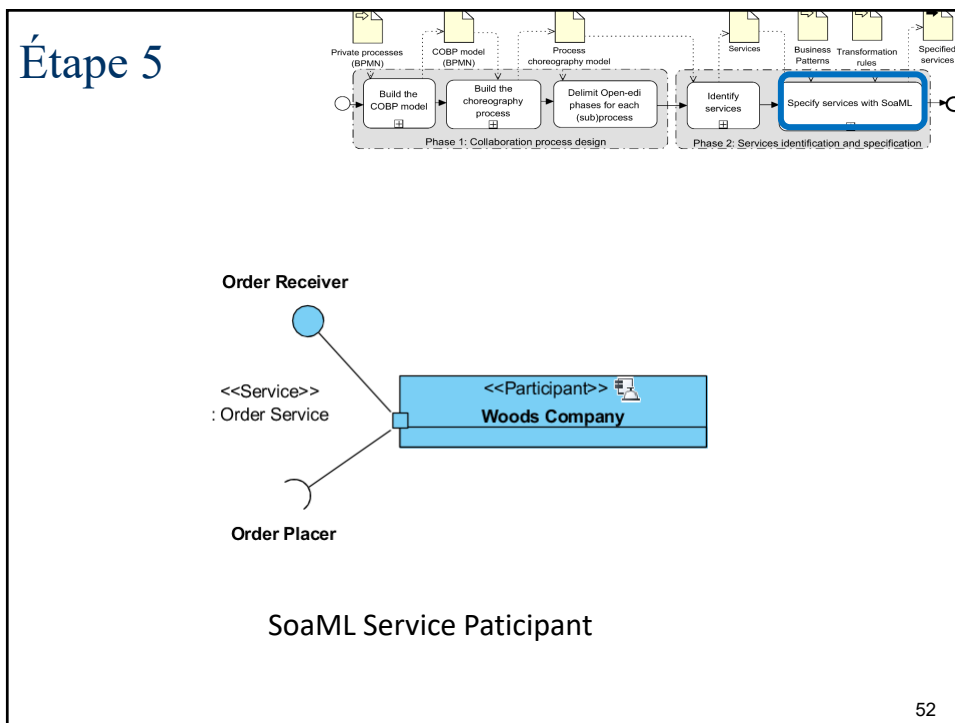
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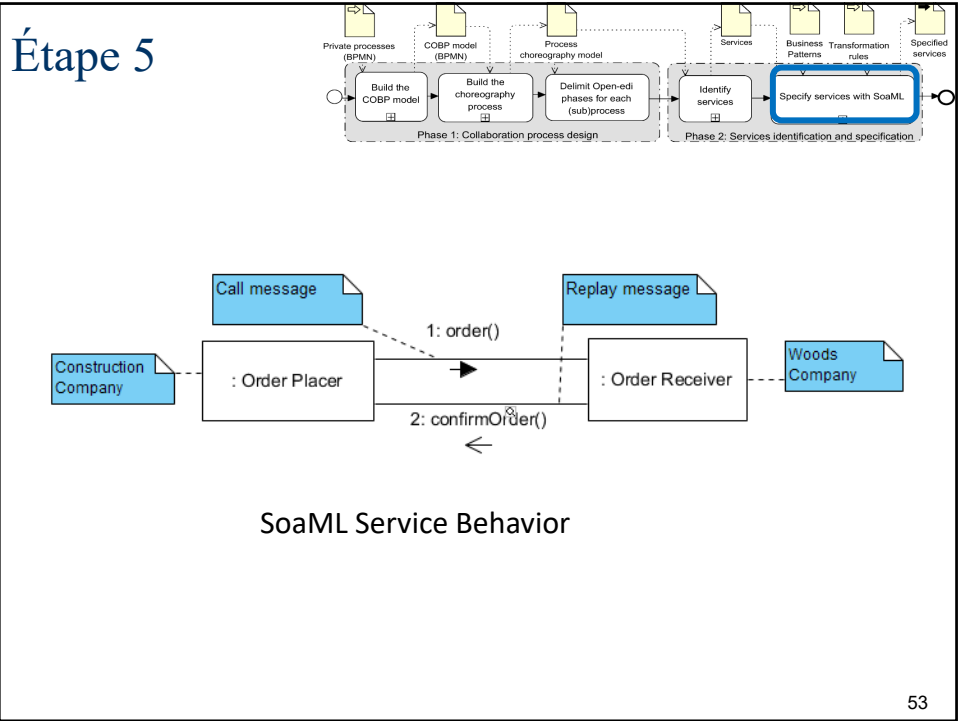
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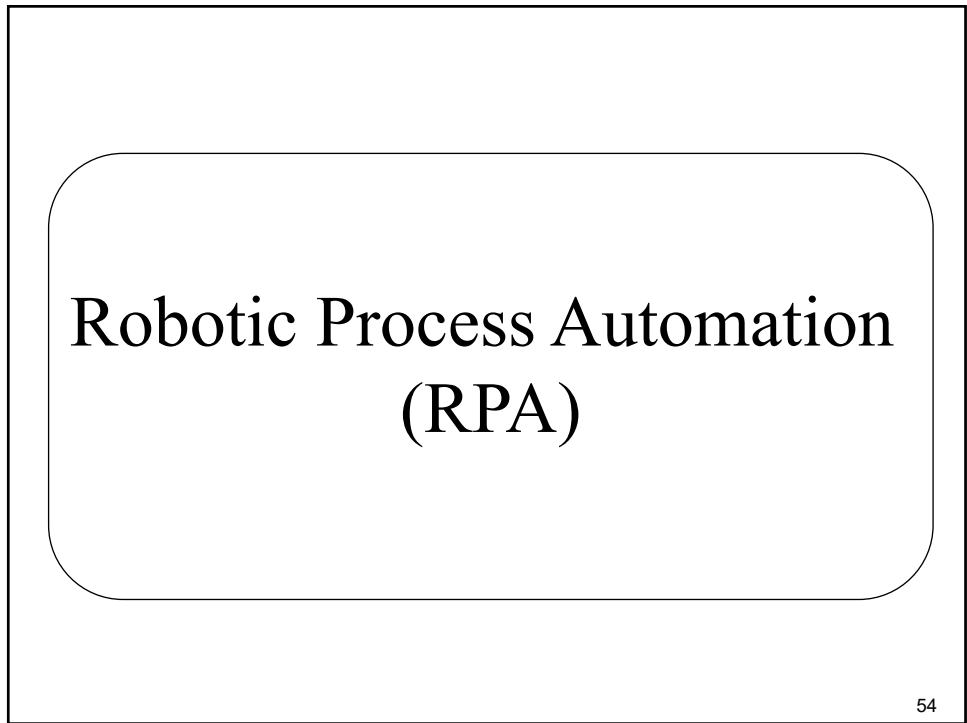
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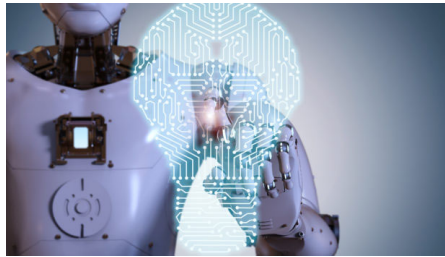
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Robotic Process Automation (RPA)

Robotic Process automation is a technology that uses software robots to automate repetitive and tedious tasks. Software robots use the graphical user interface to perform tasks on existing applications. A wide range of tasks can be automated using RPA from processing transactions to manipulating data.



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Research Questions

Is there a method that :

- 1- helps RPA practioners/organizations to identify the processes that are suitable for RPA ?
- 2- is easy to use and automate?



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RPA suitability attributes

- To compute the RPA suitability score, we evaluate two RPA attributes :
 - RPA relevance of a process or activity assesses the extent to which RPA automation is worthwhile for the process/activity;
 - RPA feasibility assesses the extent to which the process/activity lends itself to automation

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Approach 1

$$Rel(P_n) = \frac{\sum_{i=1}^n Rel(A_{p_i})}{n}$$

RPA Relevance of the process	High [1]	C Less suitable for RPA	A Highly suitable for RPA
	[0,5]	D Not suitable for RPA	B Moderately suitable for RPA
		[0] Low	[0,5] High [1]

RPA feasibility of the process

$$Pot(P_n) = \frac{\sum_{i=1}^n Pot(A_{p_i})}{n}$$

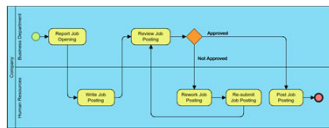
Cadre de classification RPA

Audrey Bourgoïn, Abderrahmane Leshob, Laurent Renard: Towards a Process Analysis Approach to Adopt Robotic Process Automation. IEEE ICEBE 2018: 46-53

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Approach 2



RPA
Suitability score

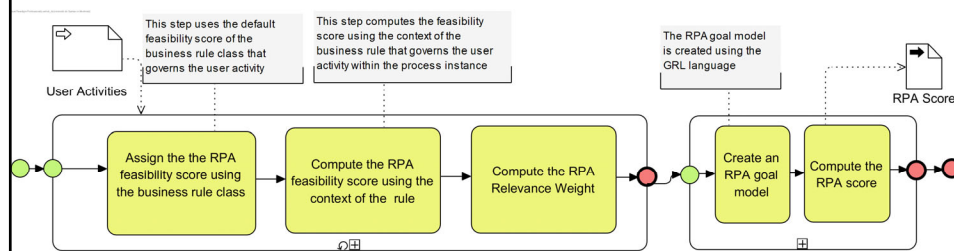


Business rules that governs
process activities

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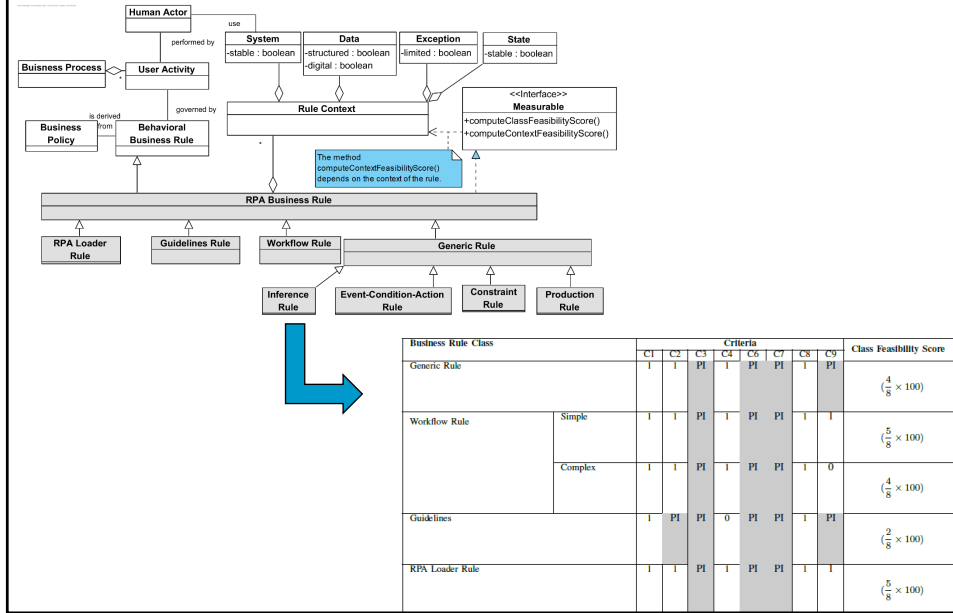
The proposed method



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RPA Feasibility



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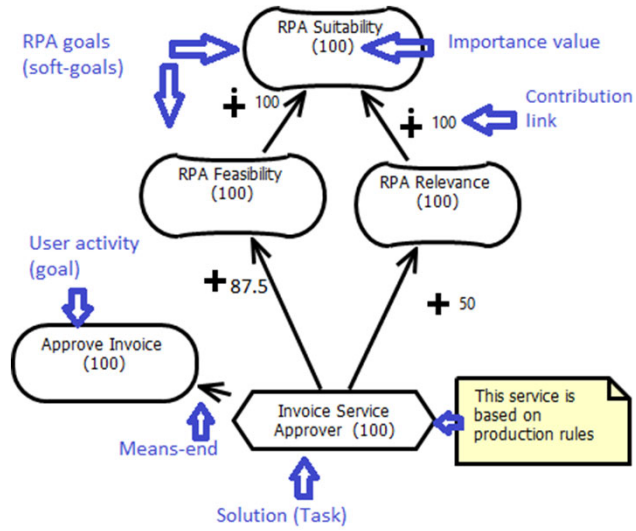
RPA Relevance

Average number of transactions performed per day	high >200	50	75	100
	Medium [20 ; 200]	25	50	75
	low <20	0	25	50
		low	medium	high
		Activity proneness to human errors		

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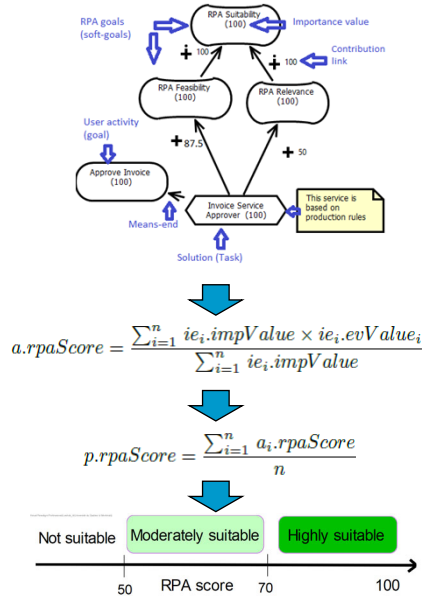
Goal Model with GRL



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RPA Relevance



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Références

1. Abderrahmane Leshob, Hafedh Mili, Javier Gonzalez-Huerta, Anis Boubaker: A value-oriented approach to business process specialization: Principles, proof-of-concept, and validation. *J. Syst. Softw.* 127: 120-149 (2017)
2. Redouane Blal, Abderrahmane Leshob, Javier Gonzalez-Huerta, Hafedh Mili, Anis Boubaker: From inter-organizational business process models to service-oriented architecture models. *Serv. Oriented Comput. Appl.* 12(3-4): 227-245 (2018)
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9. Curtis, B., Kellner, M.I., Over, J. Process modeling. *Commun. ACM* 35 (9), 75–90. doi: 10.1145/130994.130998 . Special issue on analysis and modeling in software development, 1992
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Merci

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