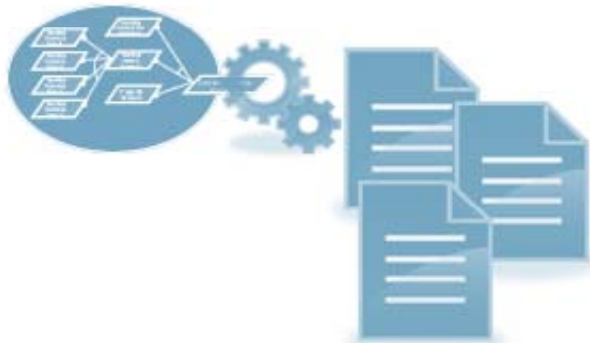


From Business Services to Web Services: an MDA Approach

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UNIVERSIDAD
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Agenda

❖ Introduction

❖ Problem description & proposed solution

❖ Objective

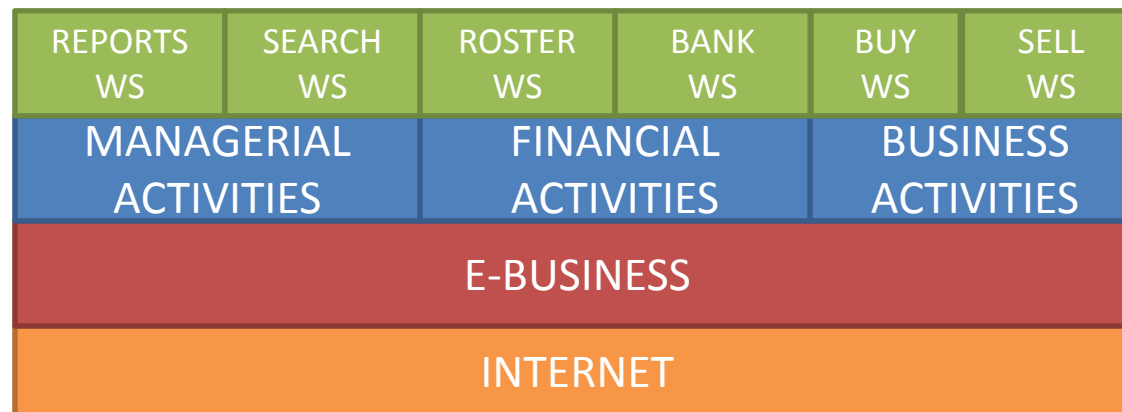
❖ The Web service generation method

❖ Conclusions



Introduction

- ❖ Internet has become an useful tool to support e-business.
- ❖ Web services are the key technology to implement e-business systems.





Introduction

❖ The main issues in defining Web services:

- Current technology in Web service modeling is not considering main needs of the organizational context.
- The lack of sources to allow the designers to reflect the business tasks and user's requirements.
- The lack of approaches to establish the correspondence between the business functionalities and those implemented in Web services.

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Problem description



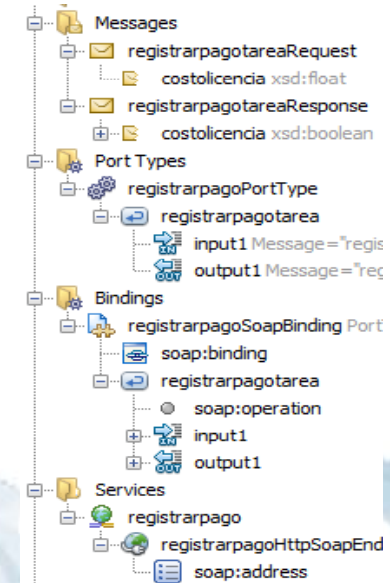
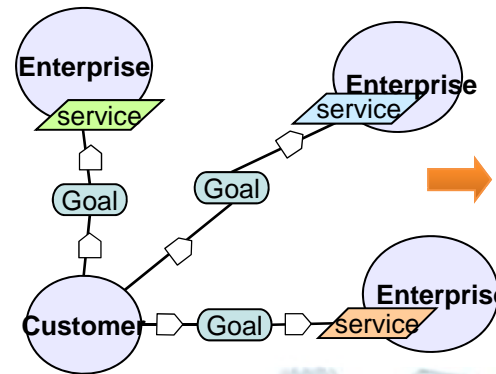
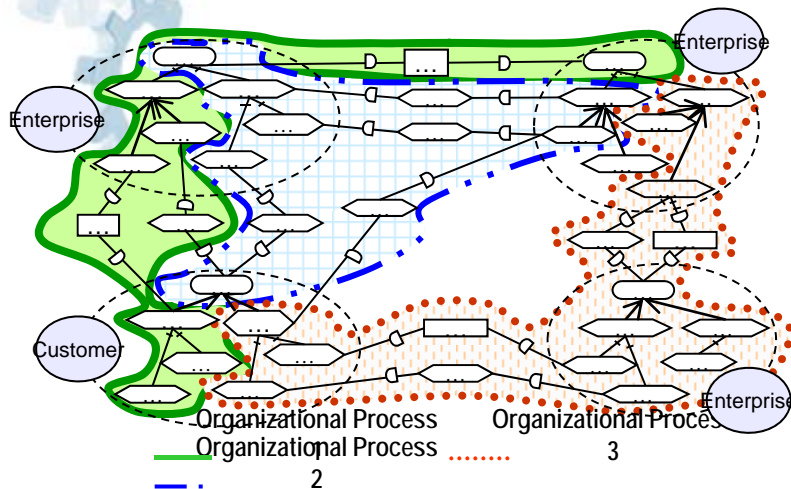
❖ Business models are not properly adapted.

❖ The lack of methodological approaches to automatically generate services from the business's features.

❖ Establishment of a good specification of the processes that are involved in the enterprise context.

The proposed solution

- ❖ Our proposal is to use a service-oriented business model (that has been developed over i^*) to get WSDL descriptions accurately



Agenda



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❖ **Objective**

❖ The Web service generation method

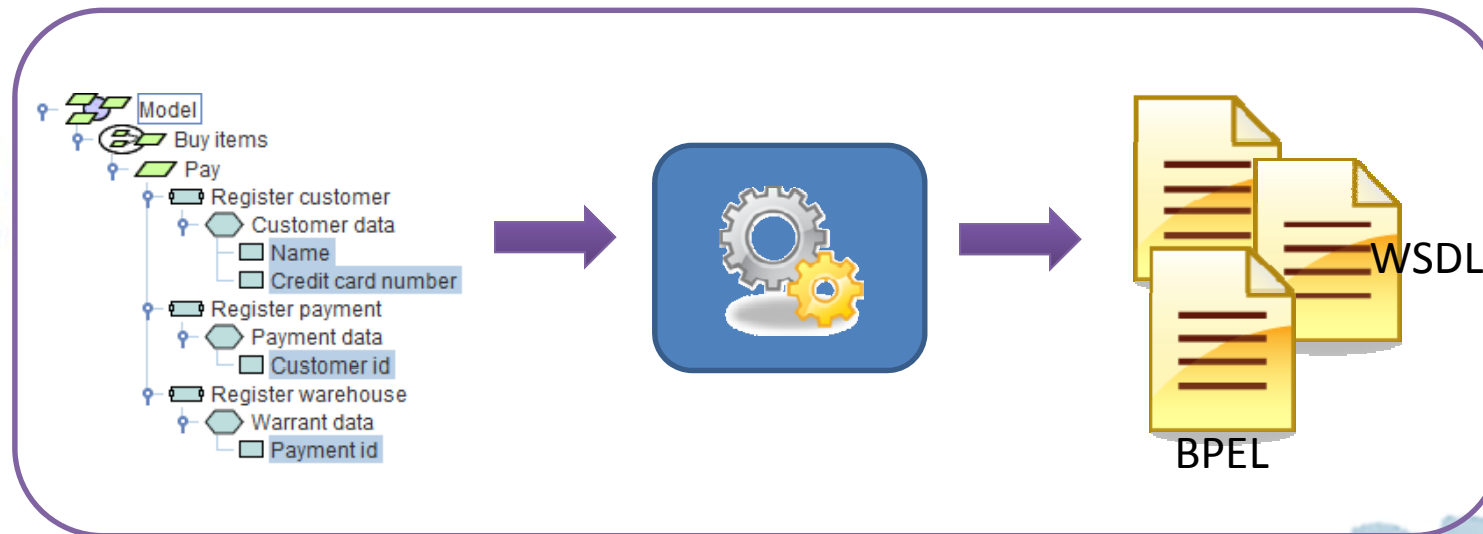
❖ Conclusions





Objective

- ❖ Obtain the WSDL specifications of Web services from service-oriented organizational models.



- ❖ By using service-oriented organizational models, it can guarantee to obtain Web services within a business environment.

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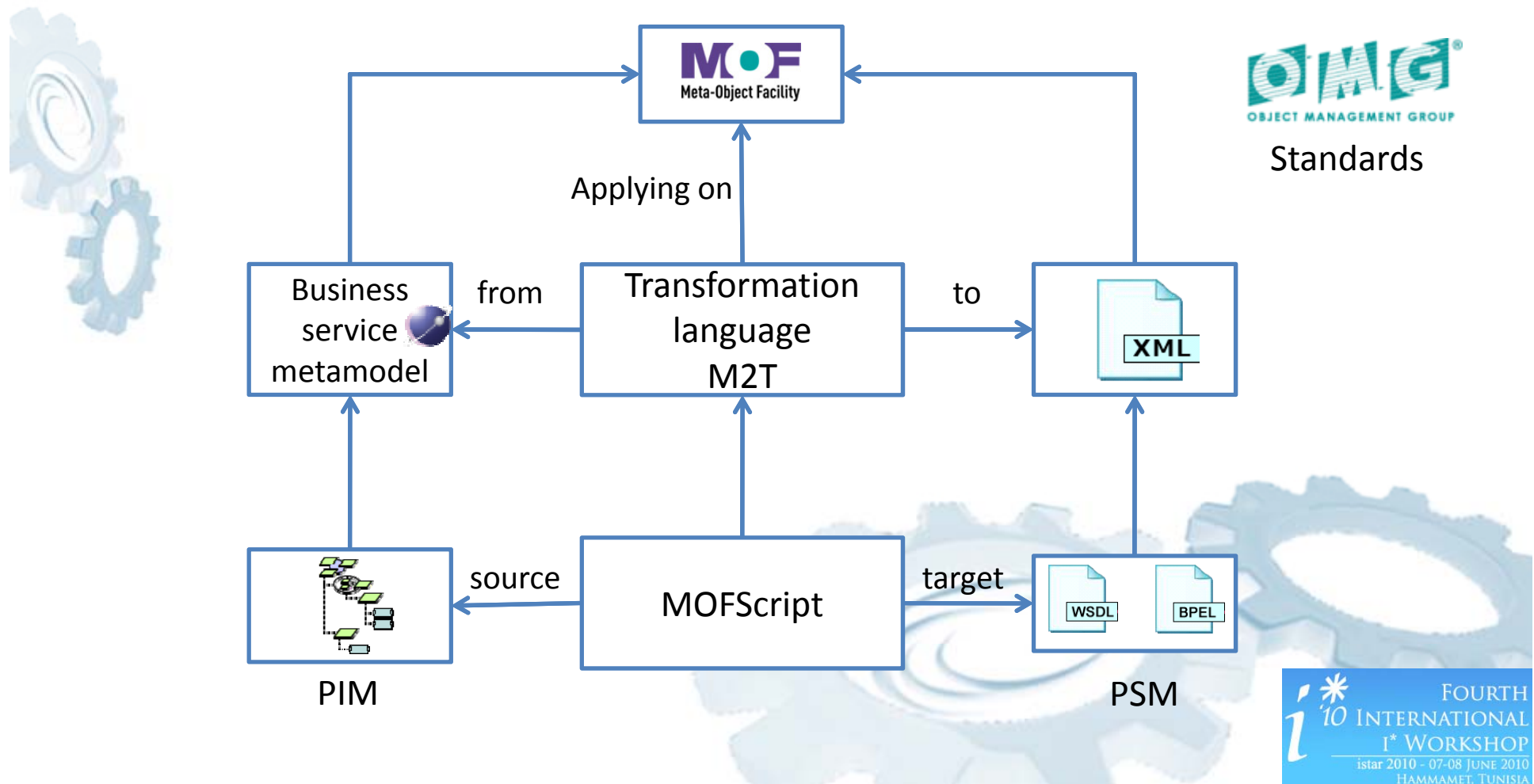
❖ **The Web service generation method**

❖ Conclusions



The Web service generation method

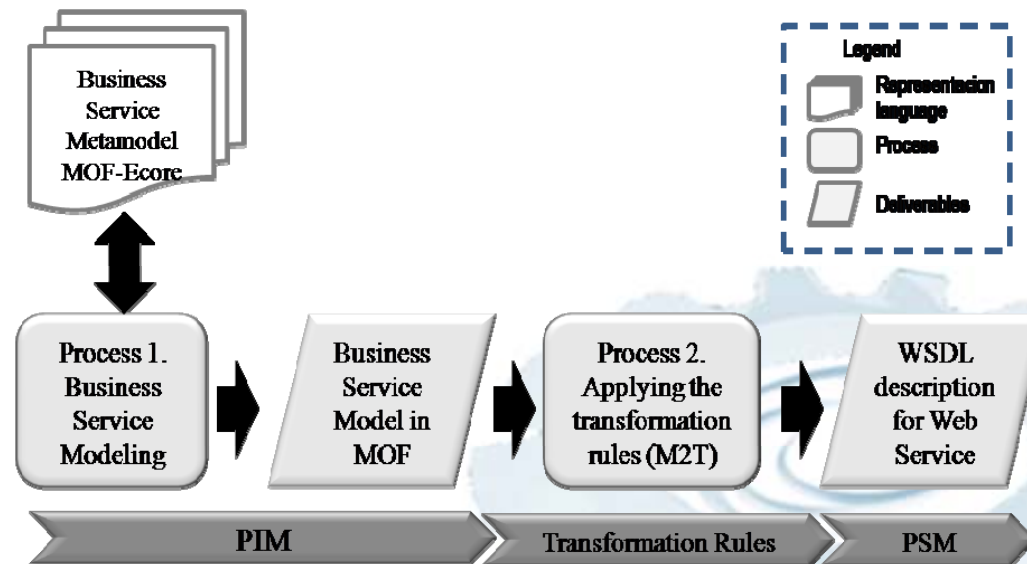
❖ MDA approach



The Web service generation method

❖ The proposed methodological approach consists of three phases:

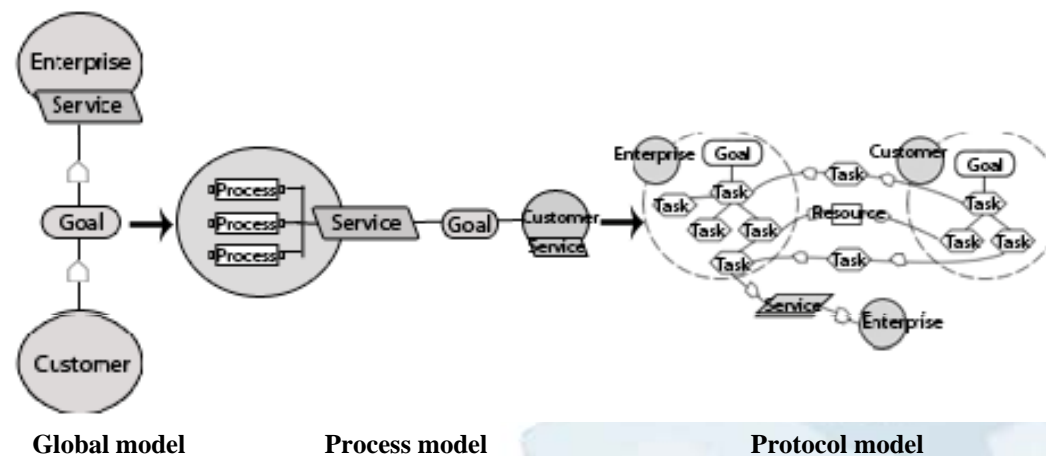
- (a) Define a business metamodel based on MOF (PIM)
- (b) Establish the transformation rules
- (c) Use MOS tool to generate the WSDL and BPEL (PSM)



The Web service generation method

❖ (a) Define a business metamodel based on MOF

- Service-oriented business models consider an enterprise as a service provider:
 - Well-defined functionalities
 - Self-contained functionalities
 - Loosely functionalities
 - Coarse-grained functionality

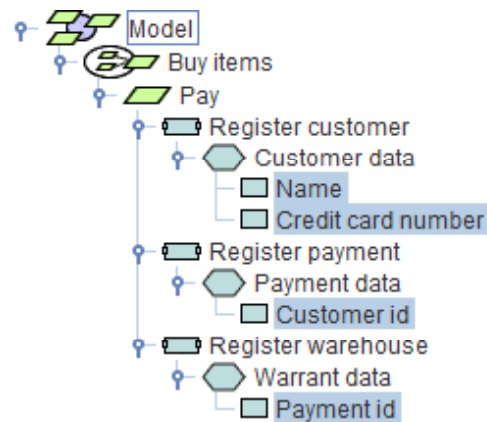


The Web service generation method

❖ (a) Define a business metamodel based on MOF

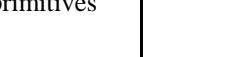




■ Service-oriented metamodel

- Created with the primitives of the service-oriented business model.
- To match the Web service with the business elements, we found that a Web service corresponds to the process element.
- The service element will represent the orchestration.



The Web service generation method

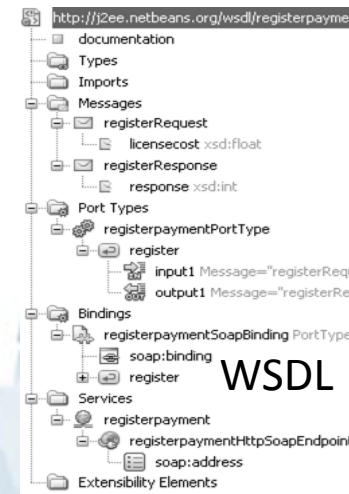
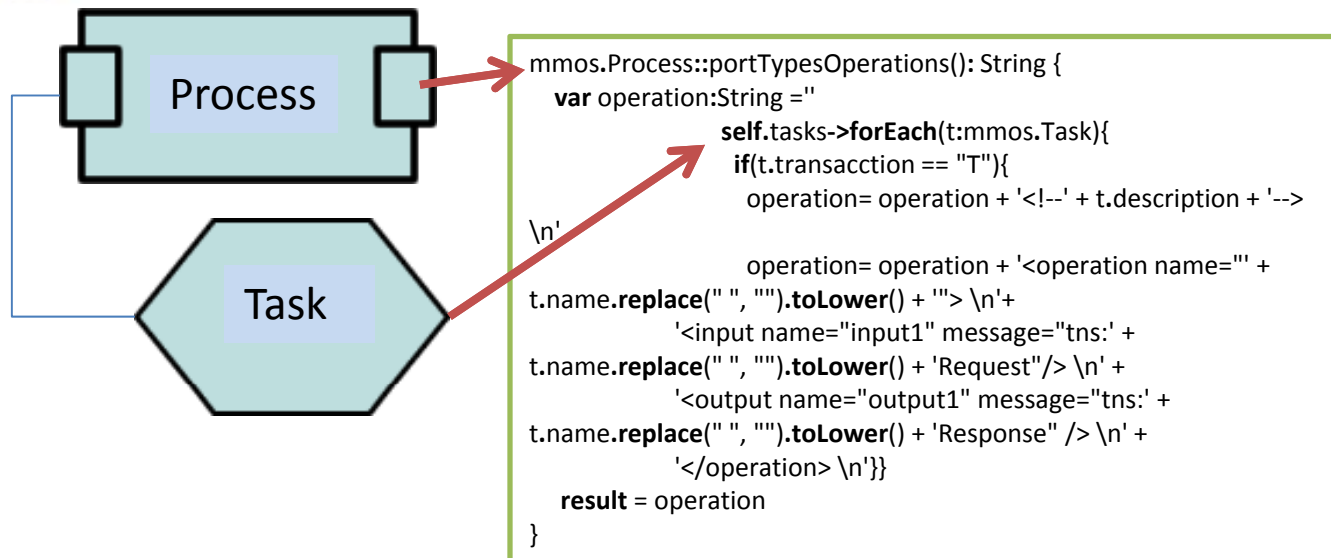
❖ (a) Define a business metamodel based on MOF

Business Service models	e-business primitives	Attributes	Attribute description
Global model, composite service model 	Aggregated service	Execution order	Participation order in business model
		Description	Details of the Service's offered
	Basic service 	Execution order	Participation order in orchestration
		Description	Service's details offered
Process model 	Process	Transaction	Indicates if it will be deployed as a Web service
		Execution order	Participation order in orchestration
		Description	Process's details about what is done
Protocol model 	Task	Transaction	Indicates if it will be deployed as an operation
		Execution order	Participation order in orchestration
		Type	Resource's type generated
		Description	Task's details about the atom activity
	Resource 	Type	Resource's type to be used by a task
		Description	Resource's details about how is used by a task

The Web service generation method

❖ (b) Establishment of the transformation rules

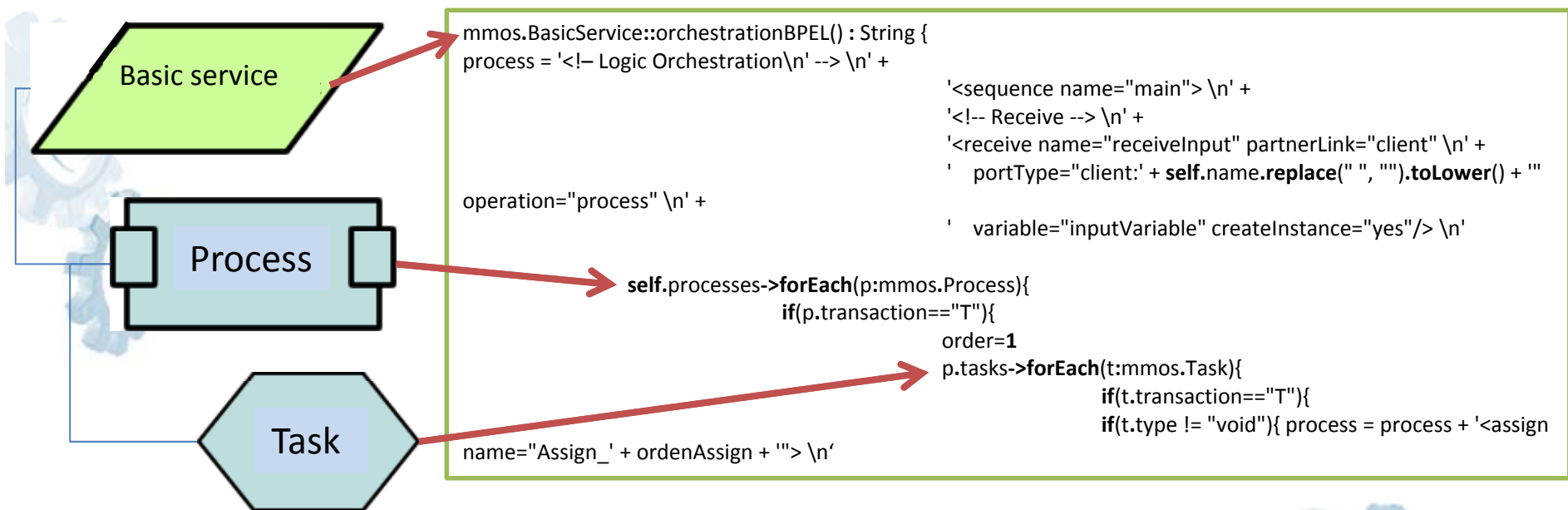
- Transformation rules in MOFScript .
- Mapping the WSDL description of a Web Service from a MOS model.
- Rules take the *.mos files as input models to generate WSDL specifications as output.





The Web service generation method

❖ (b) Establishment of the transformation rules

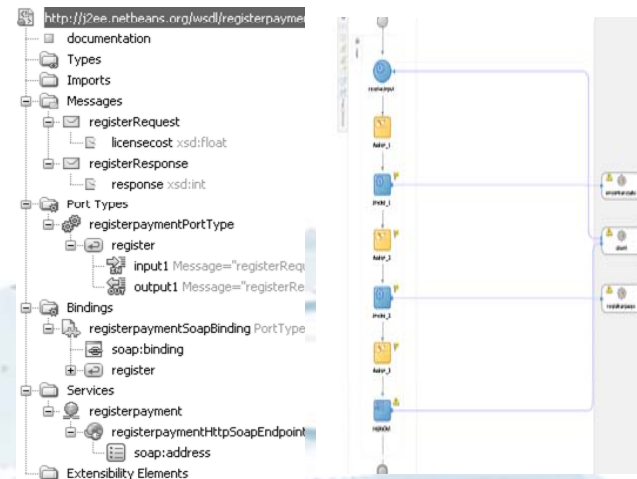
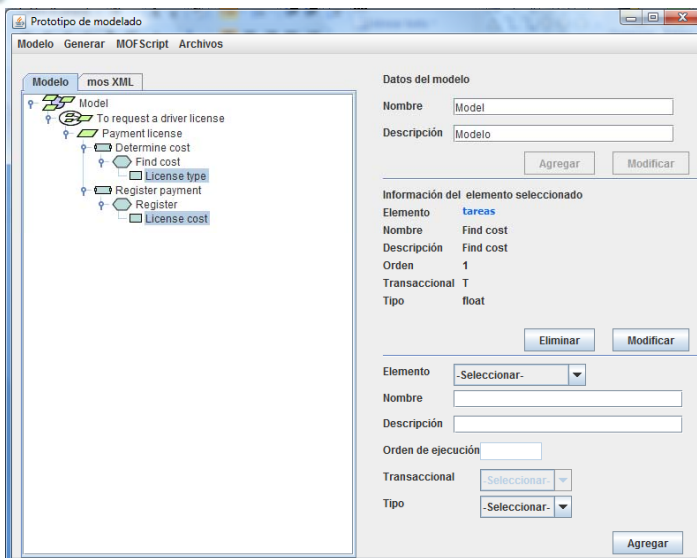


```
<sequence name="main">
  <!-- Recibe la entrada del solicitante -->
  <receive name="receiveInput" partnerLink="client"
    portType="client:tramitarrenovacion" operation="process"
    variable="inputVariable" createInstance="yes"/>
  <assign name="Assign_1">
    <copy>
```

BPEL

The Web service generation method

- ❖ (c) Use MOS tool to generate the WSDL and BPEL
 - Our system serializes the MOS model to XML
 - It stores the models as files with extension *.mos
 - It executes Eclipse V3.3.2 to apply the transformation rules using the MOFScript plug-in.



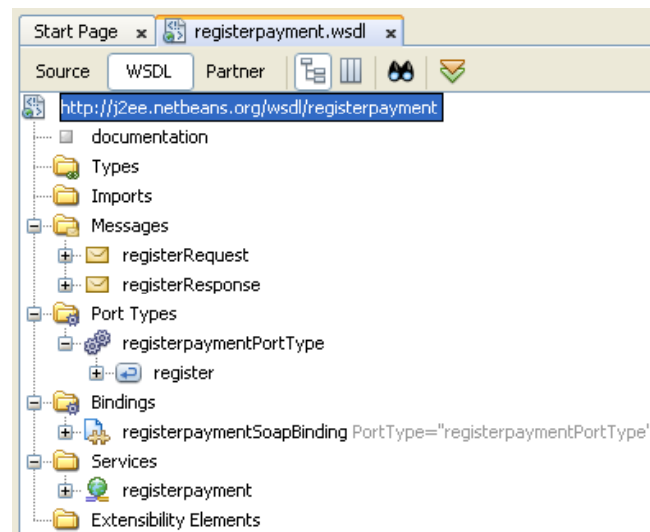
WSDL

BPEL

The Web service generation method

❖ (c) Use MOS tool to generate the WSDL and BPEL

- Once the WSDL document is created, it just needs to be checked in well-formed XML syntax. The only property that needs to be changed is the address where the implementation is located.





The Web service generation method

- ❖ (c) Use MOS tool to generate the WSDL and BPEL
 - The BPEL document uses the Web services created from the WSDL descriptions generated with the tool.
 - We consider the BPEL documents as orchestration guides.



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Conclusions

- ❖ A methodological approach is proposed to generate Web services from a business service model.
- ❖ By using a service-oriented model at an organizational level, it is possible to facilitate the work of defining Web services under a methodological approach such as MDA.



Conclusions

❖ Future work

- The generation of complete functionality of the Web service.
- Methods to use business service models to precisely generate the choreography and orchestration of services.
- Extension of the MOS Ecore metamodel to integrate all the modeling stages.



Thank you for
your attention ☺

