

21b. Guided Development of Value Added Services based on ERP Systems

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Project „Marrying Ontology and Software Technology (MOST)“

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Literature

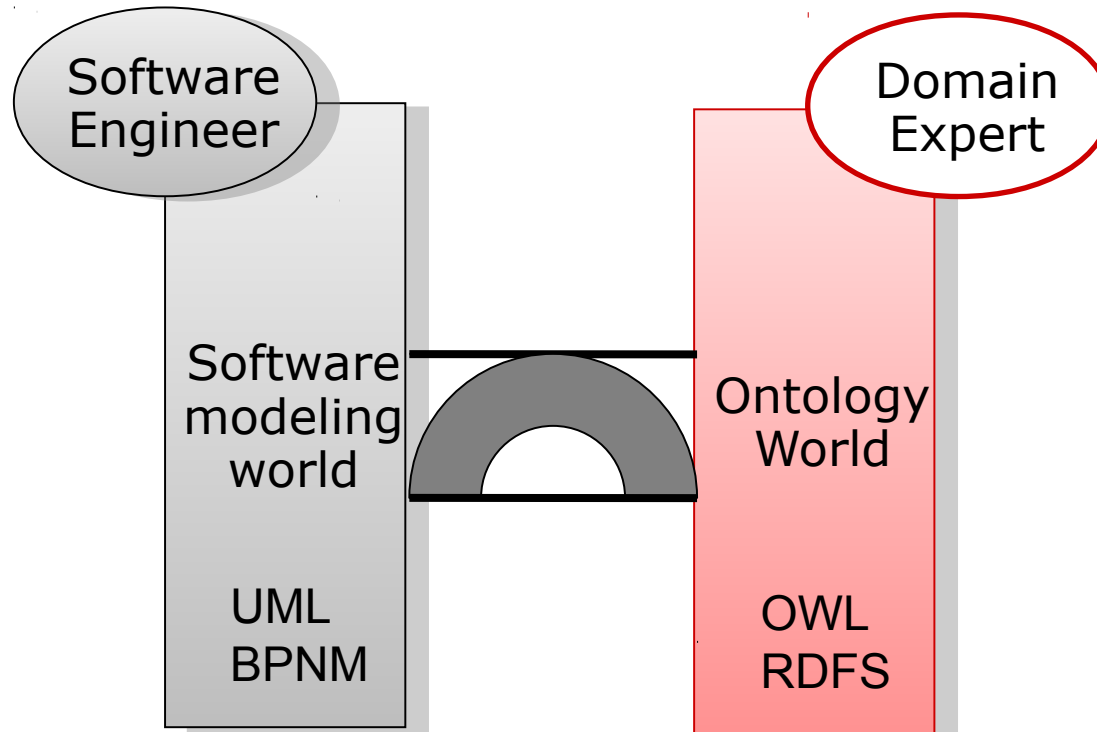
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- ▶ Semantic Technologies for Software Engineering
 - www.reasoningweb.org
 - 6th International Summer School 2010, Dresden, Germany
 - www.reasoningweb.org/2010
 - Lecture Notes in Computer Science 6325, Springer
- ▶ Ontology-Driven Software Development (ODSD)
 - Springer, 2012

Marrying Ontologies and Software Technology (MOST)

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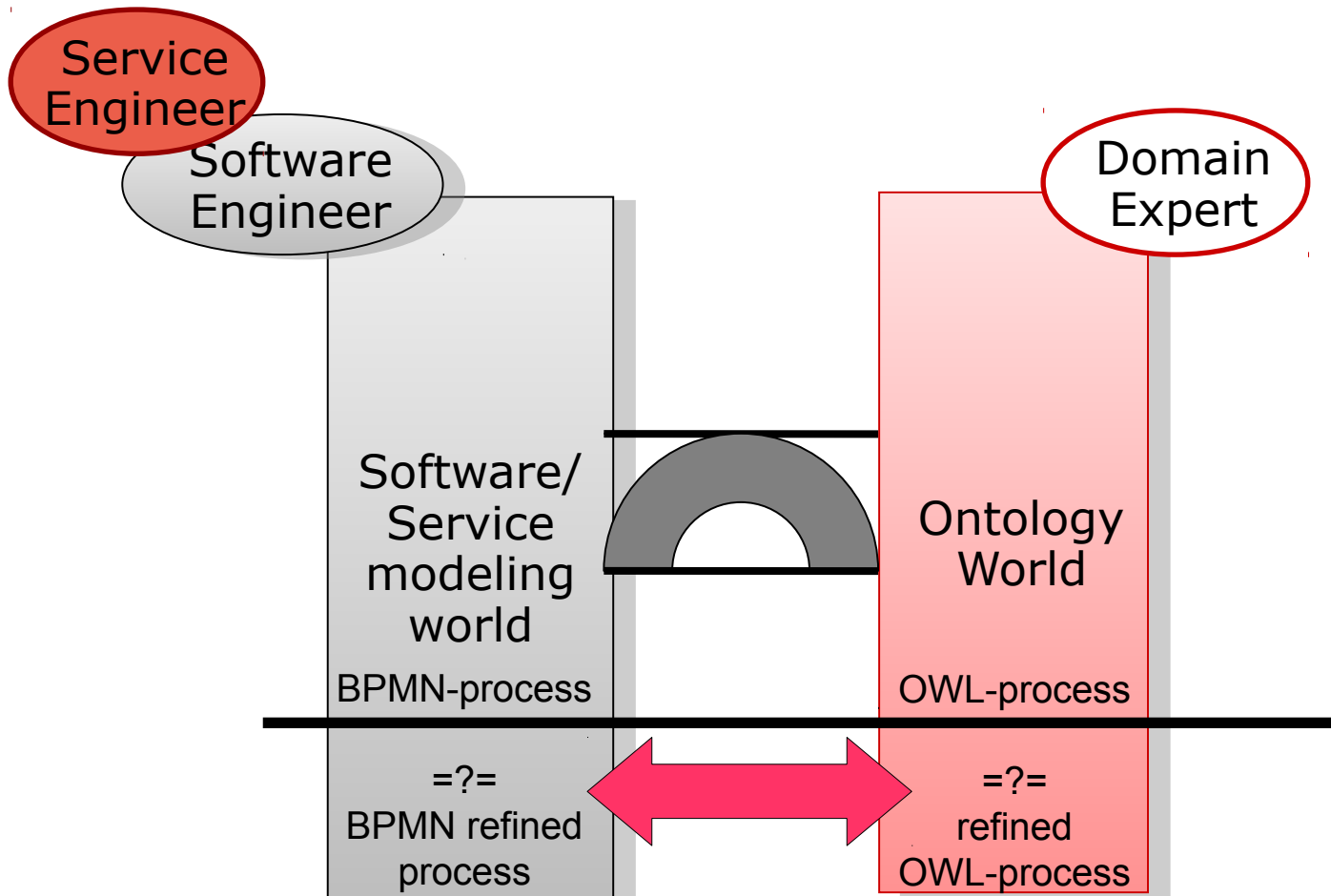
- ▶ Bring together domain knowledge and software know-how



Ontology Services for Business Process Refinement

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- ▶ Transport BPMN to OWL and check refinement



Process Refinement for Value Added Services

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- ▶ MOST developed a “Guidance Engine” for editing processes and workflows
- ▶ Development support:
 - Suggest continuation tasks
 - Invalid refinement of processes -> propose remodeling
 - Unbound tasks in processes -> propose refinement or remodeling

Workflows are edited in a Workbench (Here, ADO from BOC)

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The screenshot displays the MOSTworkbench: Modelling Toolkit (Admin) - [Process C (BPMN Business Process Diagram)] - Graphical Editor. The interface is divided into several sections:

- Task List:** A table showing a list of tasks performed in the model.
- Modelling:** The main workspace for editing the BPMN diagram.
- Validation:** A panel showing validation results, including errors and warnings.

Subject	Sender	Date	Performer	Performed At
Ground process "Process B"	Admin	07.01.2010 15:...		
Refine process "Process B"	Admin	07.01.2010 15:...		
Ground activity "Manage Developer Relati..."	Admin	07.01.2010 15:...		
Refine activity "Manage Contest Start (Pro..."	Admin	07.01.2010 15:...	Admin	07.01.2010 16:26:49

The BPMN diagram in the Modelling section shows a process flow starting with a start event, followed by a task "Select Contract...", a task "Negotiate with...", a gateway, a task "Existence Check", a gateway, a task "Pay Developer", a task "Manage Contract Start", a gateway, a task "Cancel Contract", and finally a gateway leading to an end event.

The Validation panel shows the following results:

- Errors:**
 - The object 'Cancel Contract (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to the model '...
 - The object 'Negotiate with Developer (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to th ...
- Warnings:**
- Information:**

Example: Suggest Continuation Tasks

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- ▶ „Game contests“ as processes



Available Tasks

- Remodel *Process A*
- Refine *Process Process A*
- Ground *Process Process A*
- Refine *Activity Manage Contest*
- Ground *Activity Manage Contest*

Example ctd.

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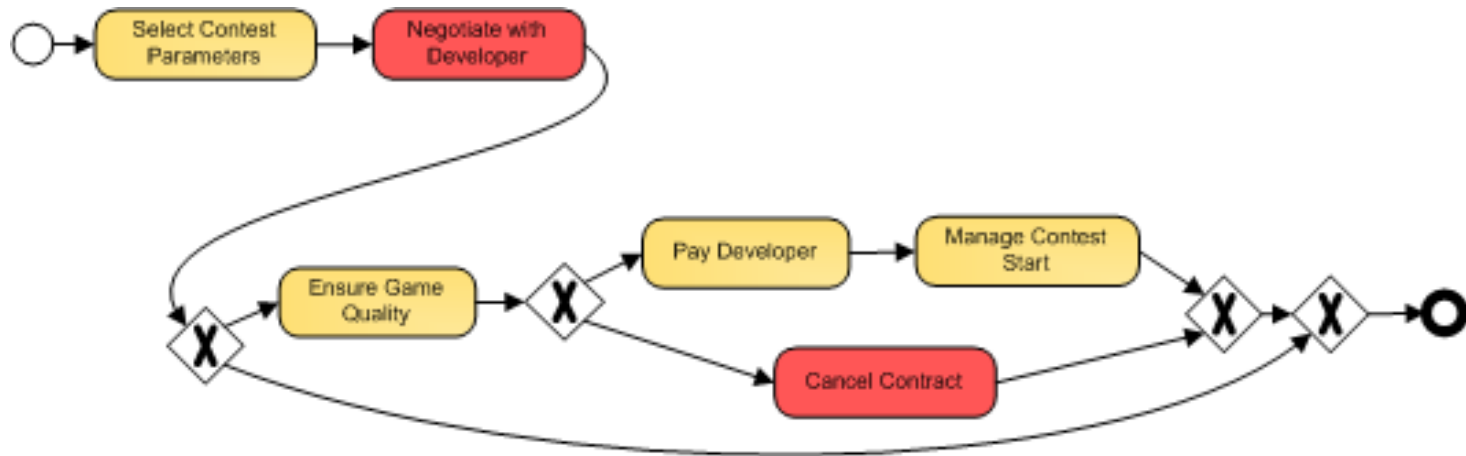


Available Tasks

- Remodel *Process B*
- Refine *Process Process B*
- Ground *Process Process B*
- Refine *Activity Select Contest Parameters*
- Ground *Activity Select Contest Parameters*
- Refine *Activity Manage Developer Relationship*
- Ground *Activity Manage Developer Relationship*
- Refine *Activity Manage Contest Start*
- Ground *Activity Manage Contest Start*

Discover Refinement Clashes

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Flow Violations

- Detected invalid flow from activity *Negotiate with Developer*
- Detected invalid flow from activity *Cancel Contract*

Screenshot: Marking Faulty Refinements (Red)

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The screenshot displays the MOSTworkbench: Modelling Toolkit (Admin) interface. The main window shows a BPMN diagram for 'Process C (BPMN Business Process Diagram)'. The diagram includes a start event, a 'Select Contract' task, a 'Negotiate with...' task (highlighted in red), a 'Pay Developer' task, a 'Manage Contract' task, and a 'Cancel Contract' task (highlighted in red). The diagram is connected by various BPMN connectors and gateways.

The Task List pane shows the following entries:

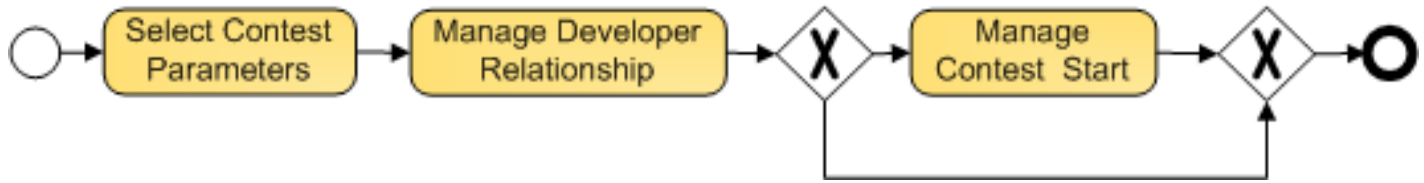
Subject	Sender	Date	Performer	Performed At
Ground process "Process B"	Admin	07.01.2010 15:...		
Refine process "Process B"	Admin	07.01.2010 15:...		
Ground activity "Manage Developer Relati..."	Admin	07.01.2010 15:...		
Refine activity "Manage Contest Start (Pro..."	Admin	07.01.2010 15:...	Admin	07.01.2010 16:26:49

The Validation pane shows the following error messages:

- The object 'Cancel Contract (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to the model '...
- The object 'Negotiate with Developer (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to th ...

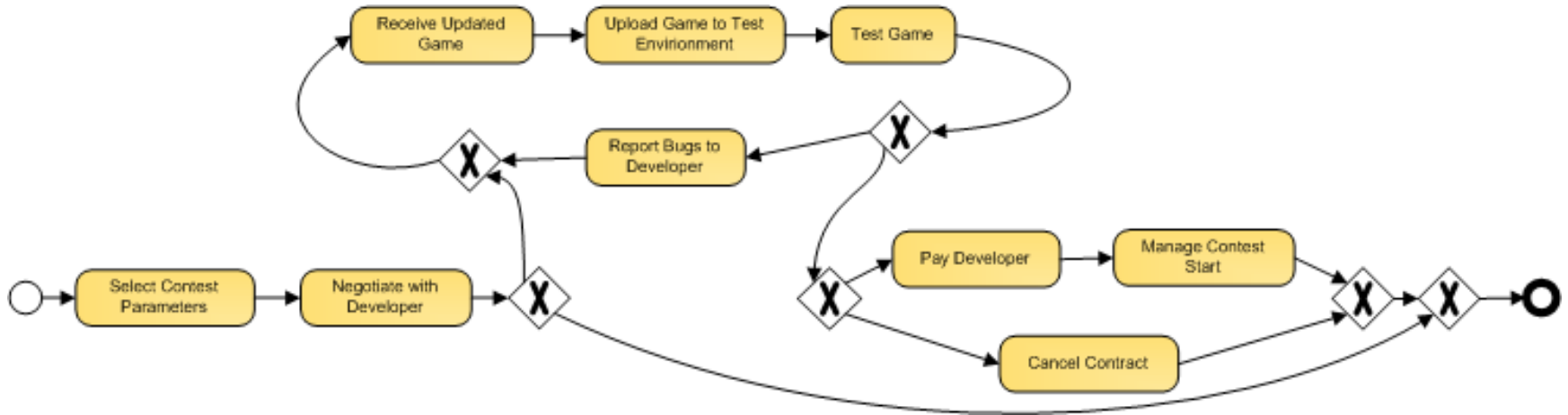
At the bottom of the window, it says 'Successfully saved.' and shows the language 'English', database 'most21', and repository 'Standard-Repository'.

Example Remedied



Example: Now Refinement Works!

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Screenshot: MOST Workbench on ADO

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The screenshot displays the MOST Workbench interface for editing a BPMN Business Process Diagram. The main workspace shows a process flow starting with a start event, followed by 'Select Contract' and 'Negotiate with...'. A decision gateway leads to 'Pay Developer' and 'Manage Contract', with a 'Cancel Contract' task as an alternative path. The Task List table below the diagram shows the following data:

Subject	Sender	Date	Performer	Performed At
Ground process "Process B"	Admin	07.01.2010 15:...		
Refine process "Process B"	Admin	07.01.2010 15:...		
Ground activity "Manage Developer Relati..."	Admin	07.01.2010 15:...		
Refine activity "Manage Contest Start (Pro..."	Admin	07.01.2010 15:...	Admin	07.01.2010 16:26:49

The Validation panel at the bottom indicates two errors:

- The object 'Cancel Contract (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to the model '...
- The object 'Negotiate with Developer (TASK)' in the model 'Process C (BPMN)' represents an inconsistent refinement with respect to th ...



Technology: Process Refinement Ontology

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- ▶ Process ontology
 - Tasks as concepts
 - Ordering relations as *to* and *from* properties
- ▶ Refinement constraints:
 - Execution order after refinement must correspond to order before refinement
 - Pre-refinement process as constraints of post-refinement process