

# Language workbenches for model and language heterogeneity

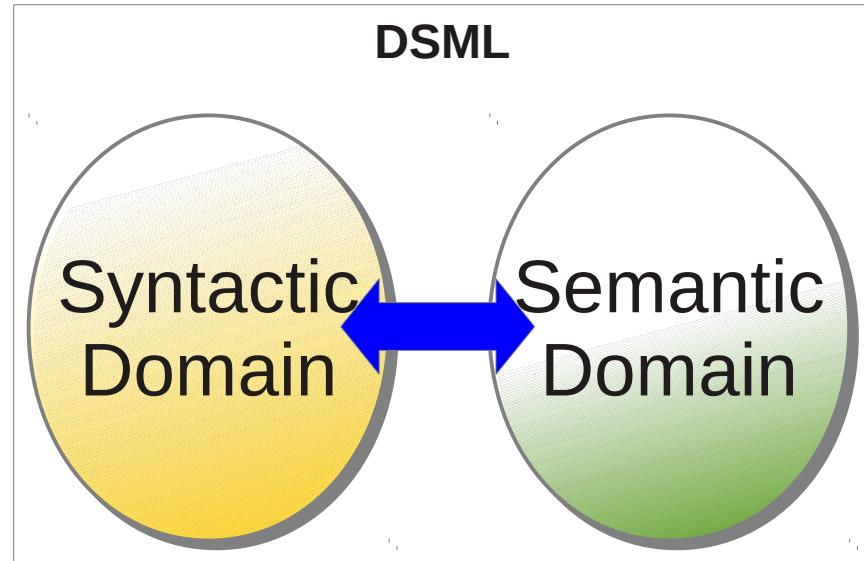
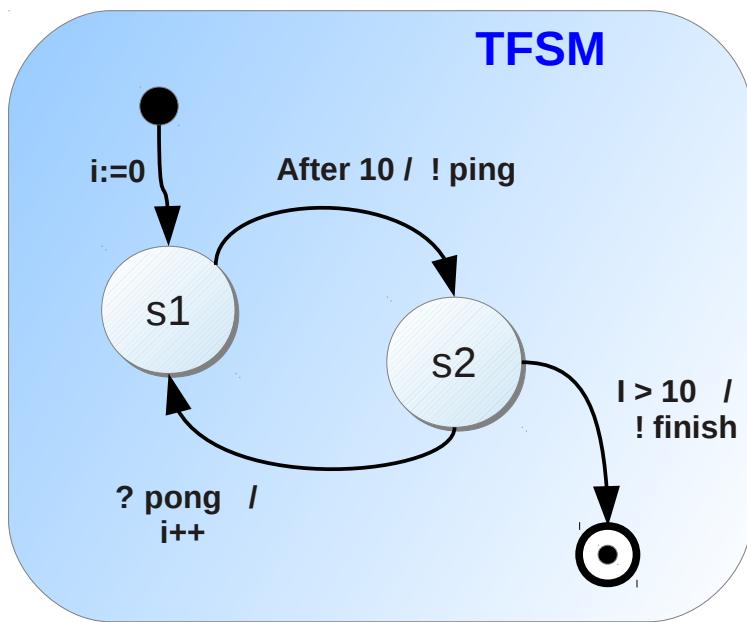
## Gemoc studio

Julien DeAntoni (AOSTE team: University of Nice /I3S / INRIA)  
and all Gemoc ANR partners

A large, semi-transparent watermark of the word "Gemoc" in a bold, dark grey font, set against a background of white clouds on a blue sky.

SUPPORTED BY  
**ANR**

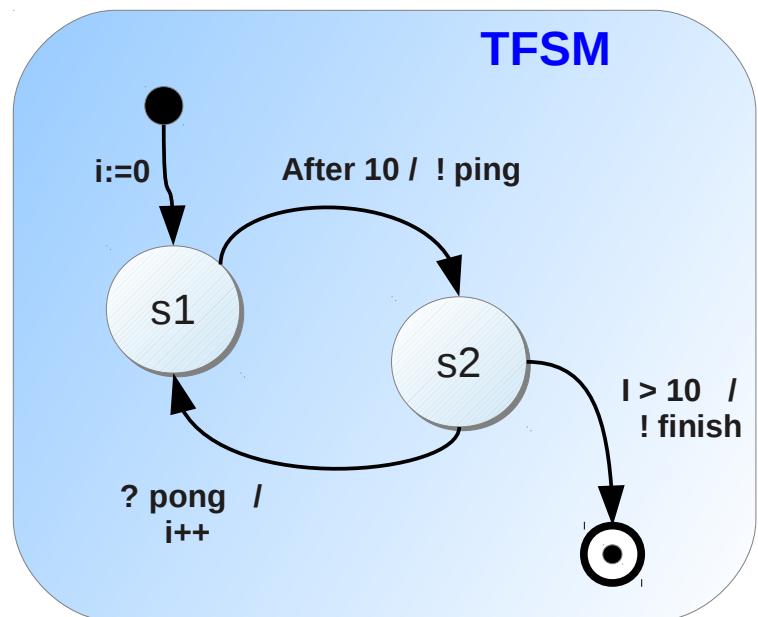
# from what ingredients a DSML is made up with ?



Considering the semantics domain as opaque makes difficult the composition

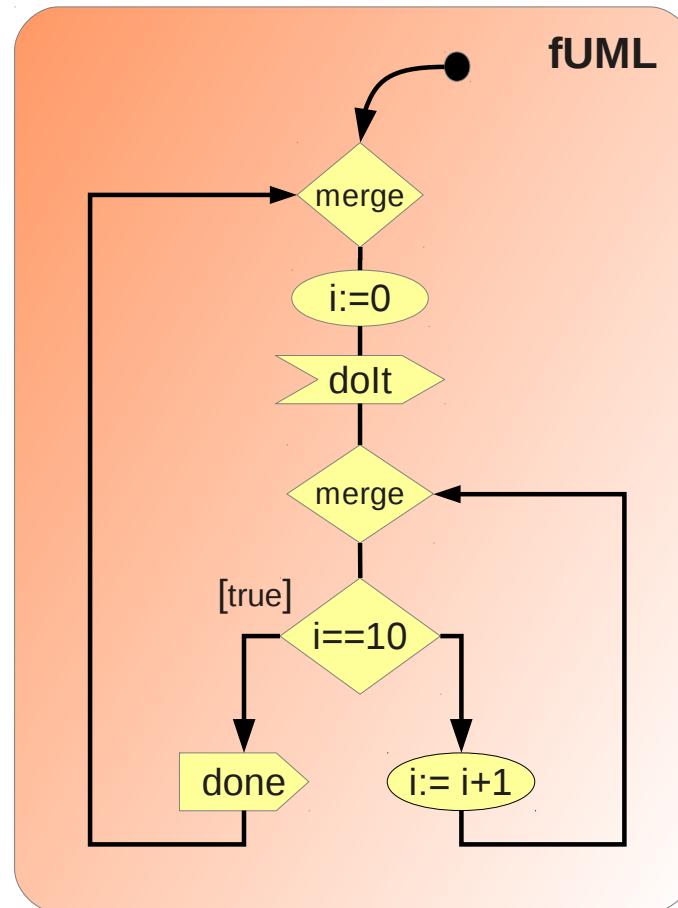
# from what ingredients the semantic domain is made up with ?

- Data management
  - Structuring
  - Computing
  - ...
- Conditional control
  - If (boolean condition)
  - When
    - Internal control (tokens)
    - External control (events)



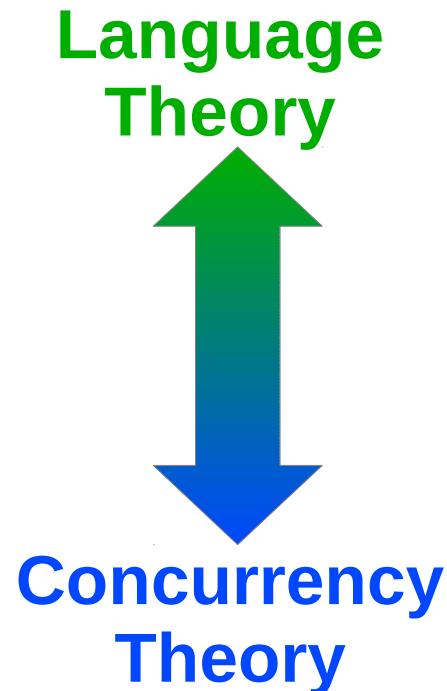
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    - *Internal* control
    - *External* control



# from what ingredients the semantic domain is made up with ?

- “sequential” semantics specification
  - Operational
  - Axiomatic
  - Translational
  - ...
- Concurrency specification
  - Tagged structure
  - Event structure
  - Model of Computation
  - ...

Specifies evolution  
of the model state

Language  
Theory

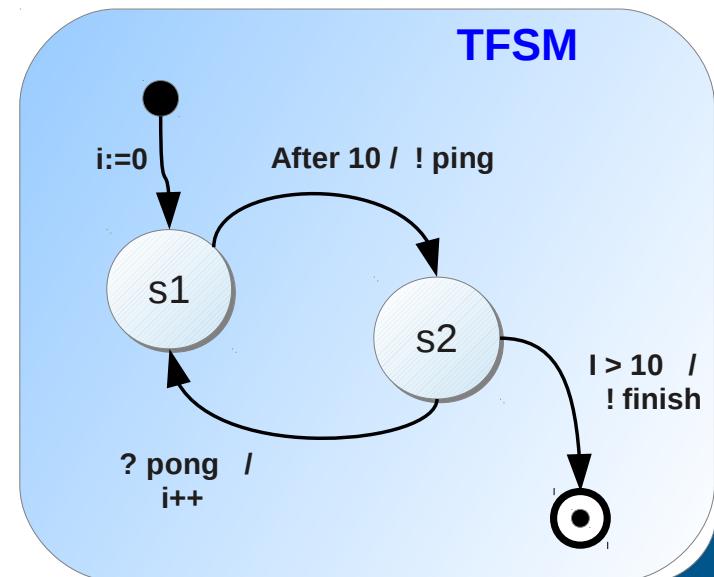
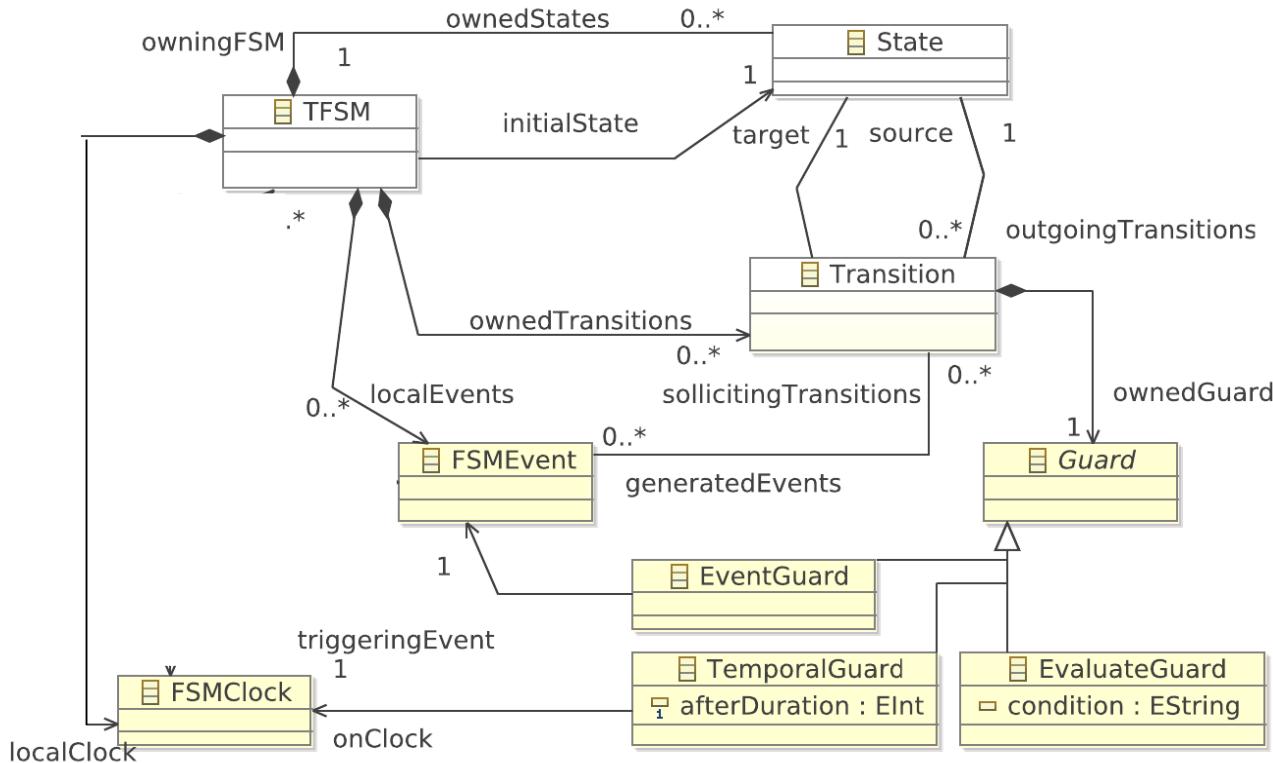


Specifies (possibly timed)  
Causal relation and  
synchronization

Concurrency  
Theory

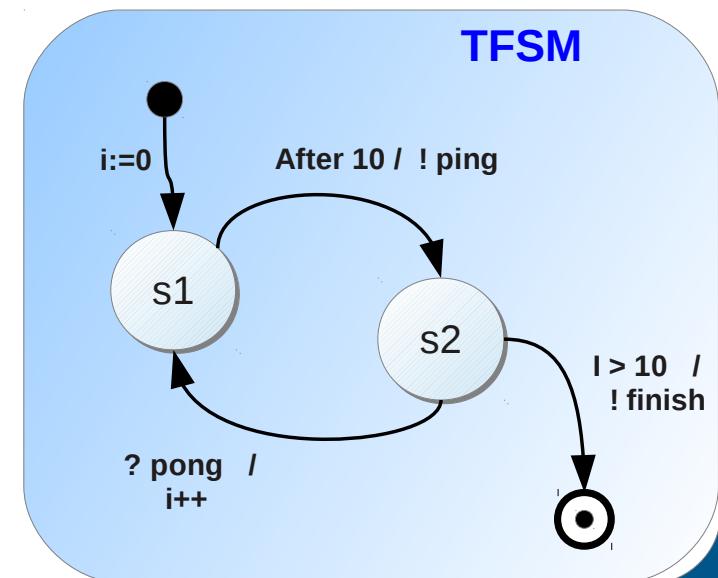
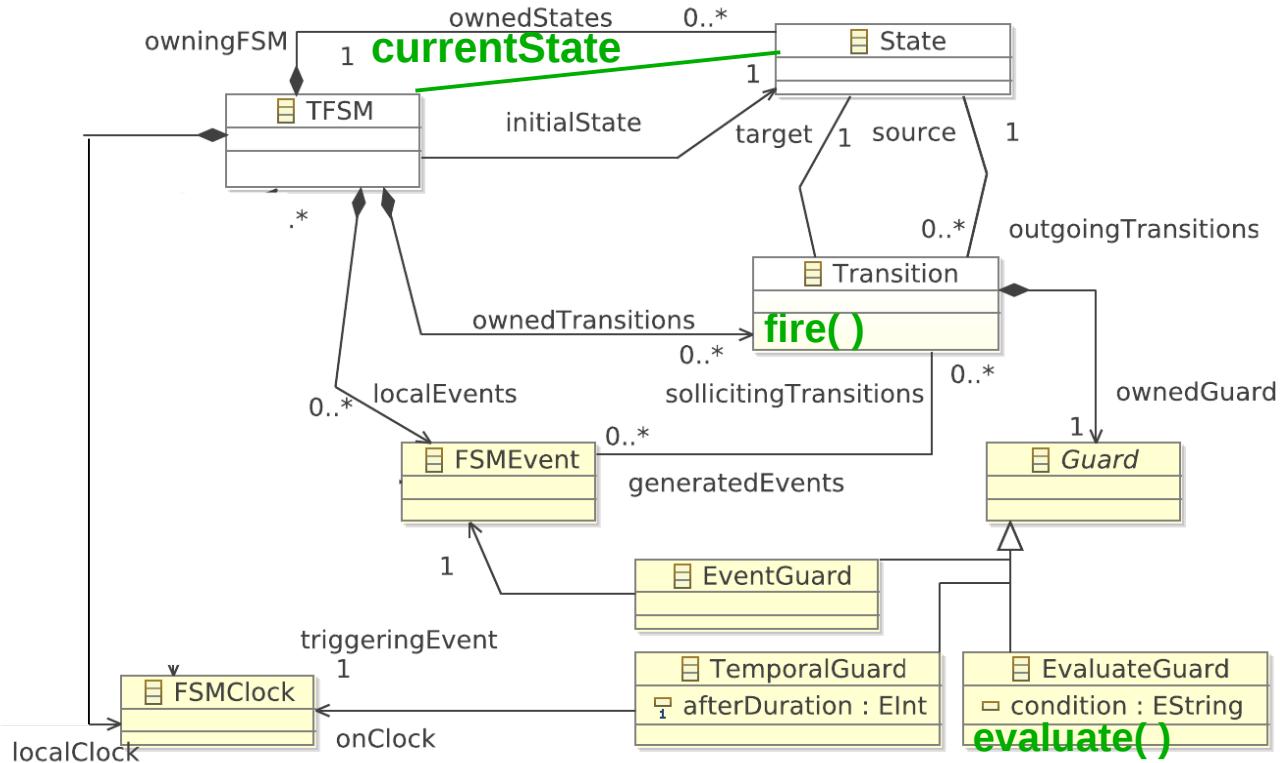
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DSML  $\stackrel{\text{def}}{=} \langle \text{Abstract Syntax}, \dots, \dots, \dots \rangle$



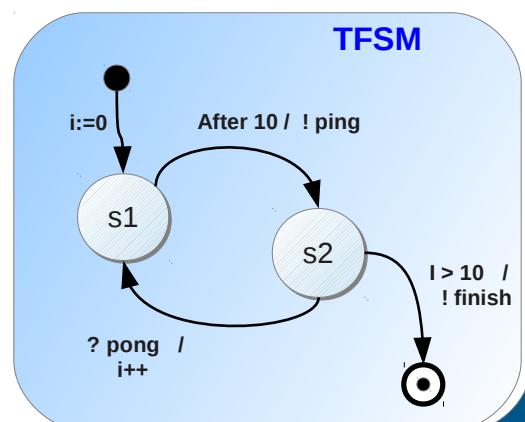
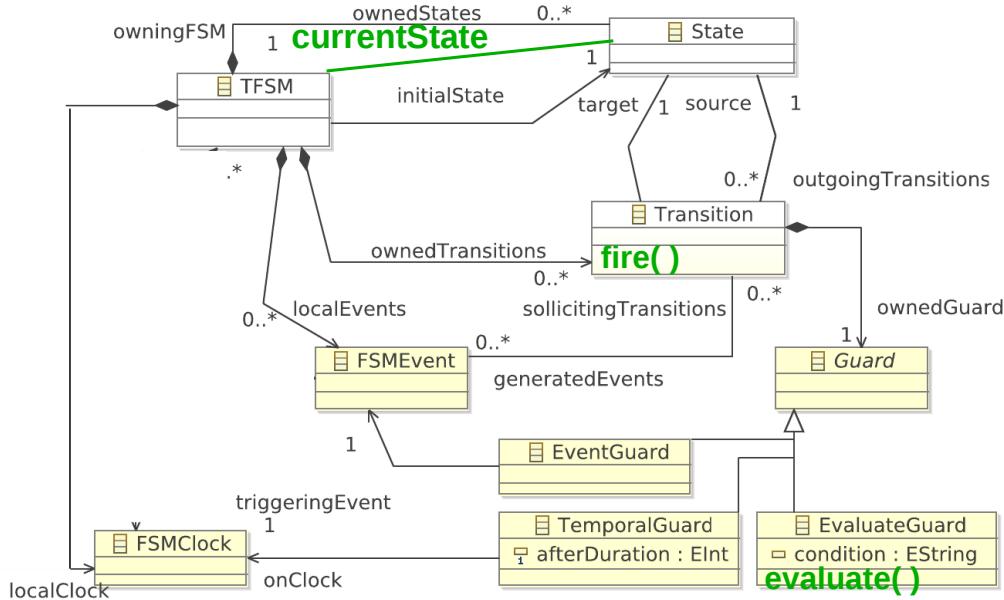
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DSML  $\stackrel{\text{def}}{=} \langle \text{AS}, \text{Domain Specific Actions}, \dots, \dots \rangle$



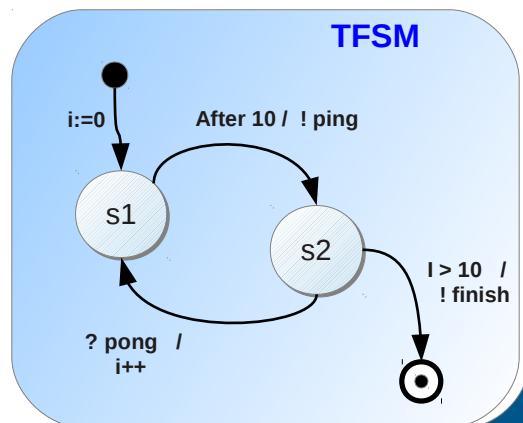
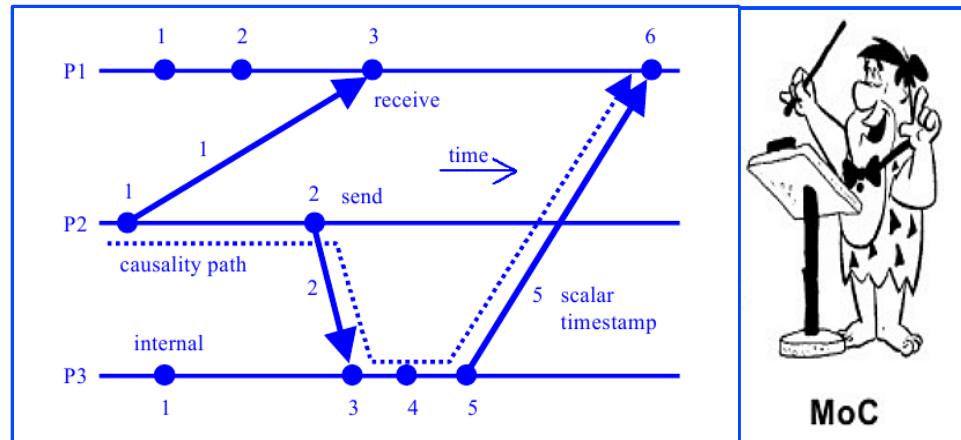
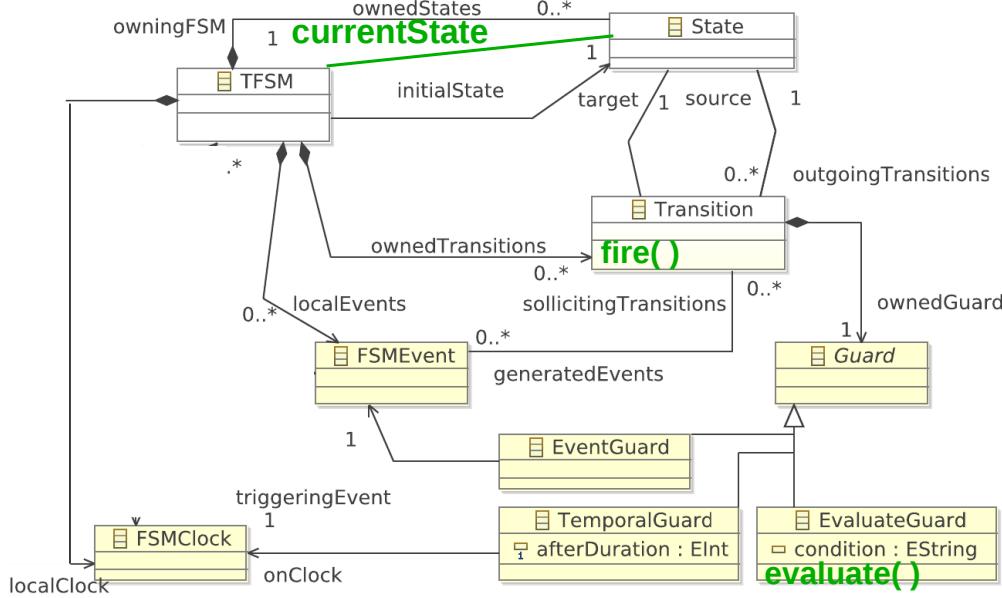
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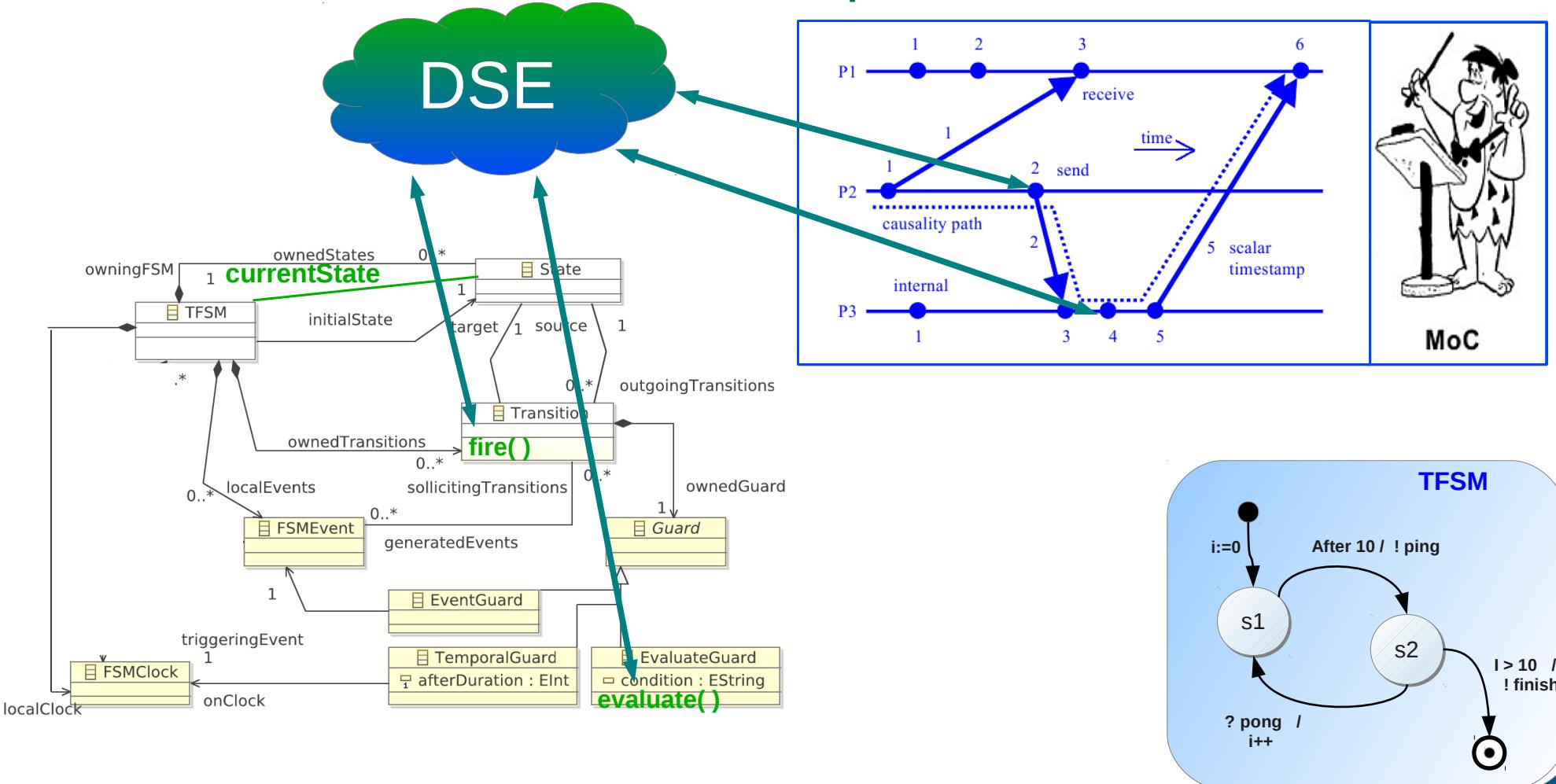
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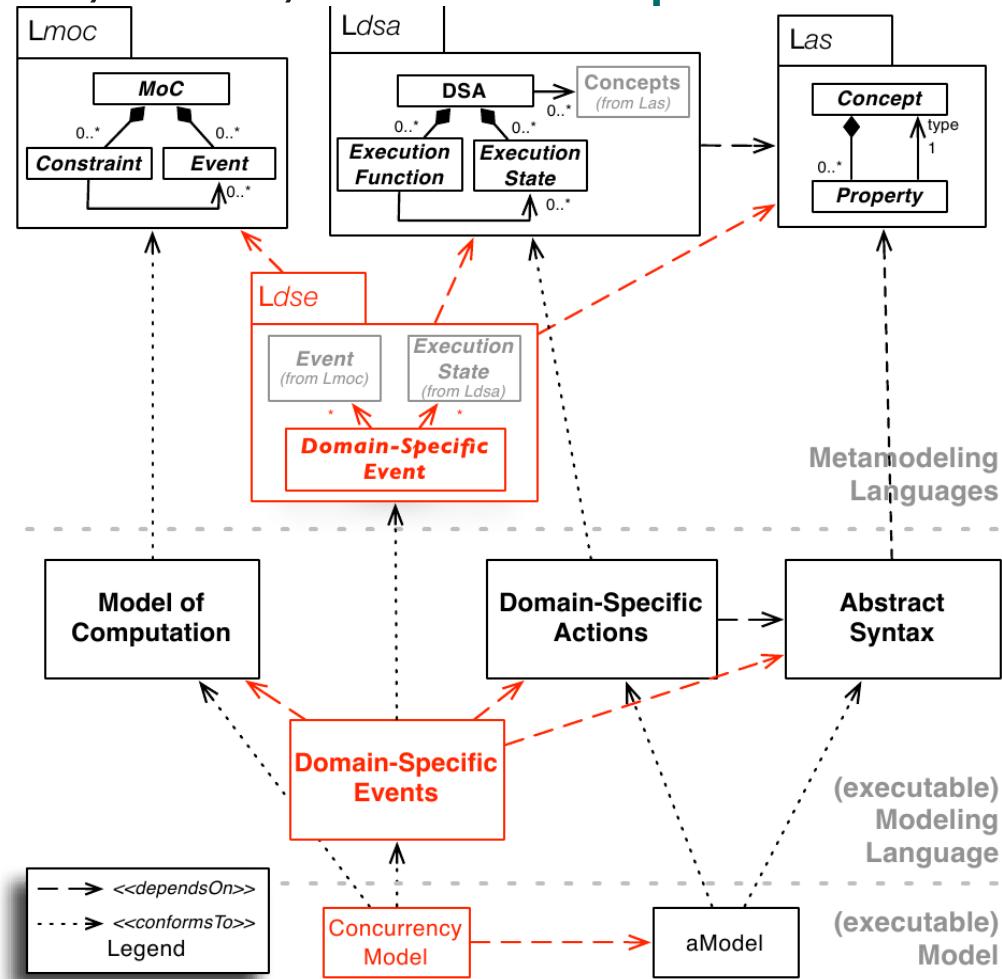
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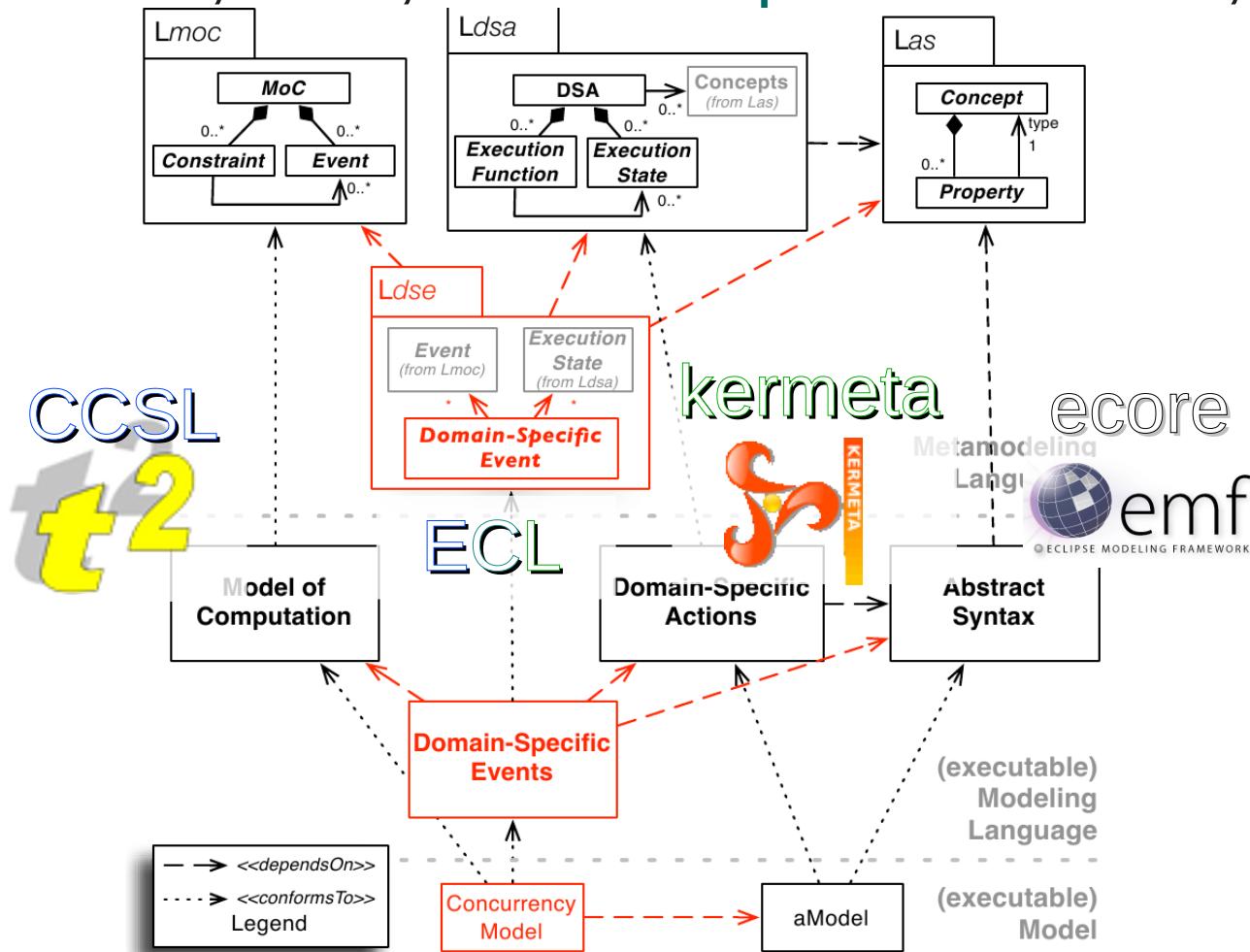
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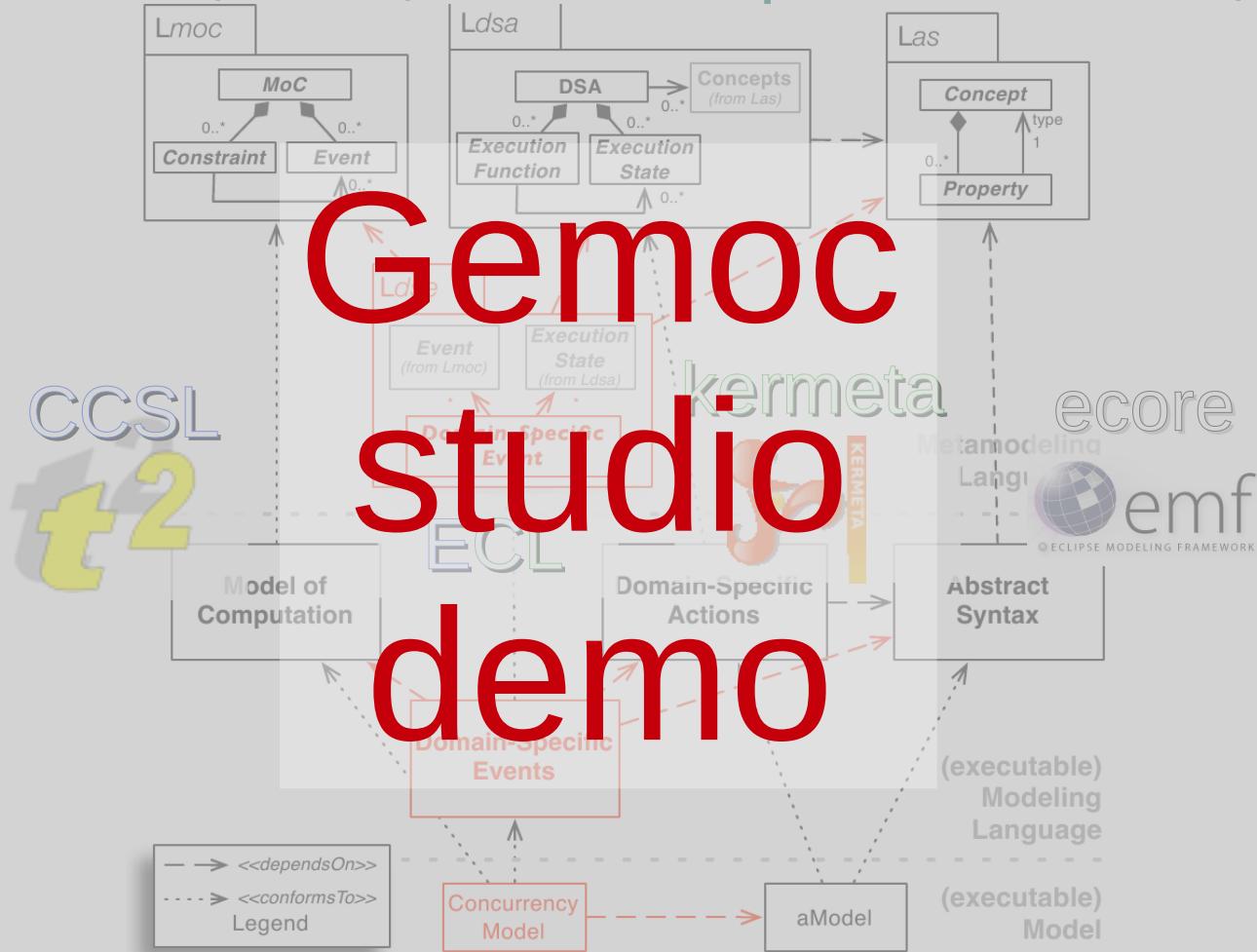
# Ingredients a DSML is made up with in the gemoc studio

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DSML  $\stackrel{\text{def}}{=}$  < AS, DSA, Domain Specific Events , MoC >

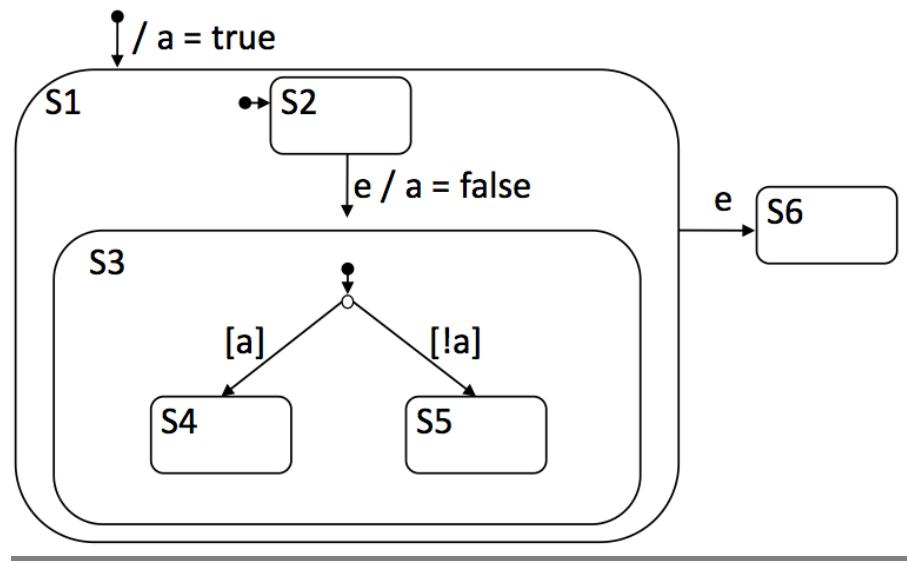


# model behavioral composition

What is the behavior of this ?

Event "e" leads to  
• S4 (UML),  
• S5 (Rhapsody),  
• or (S6) Stateflow

"UML vs. Classical vs. Rhapsody Statecharts:  
Not All Models are Created Equal ",  
Michelle Crane, Juergen Dingel



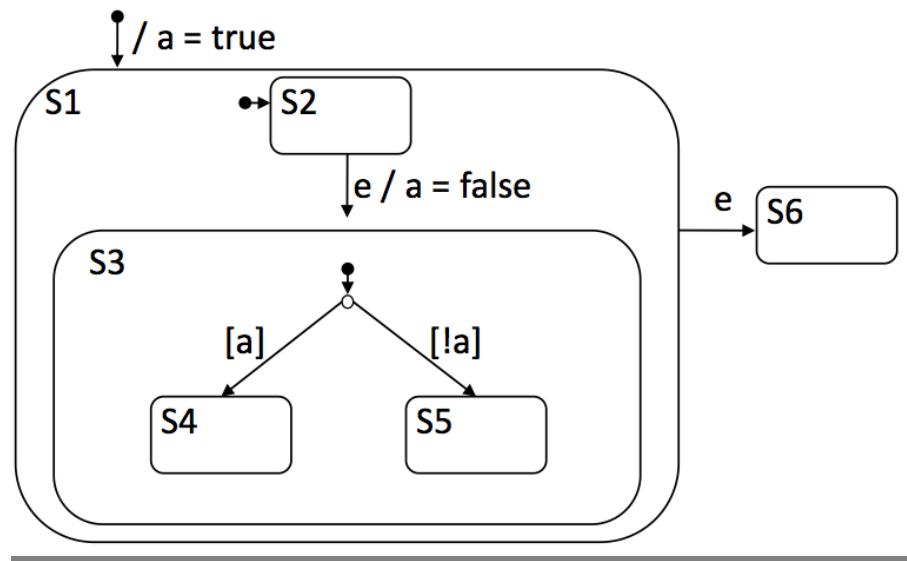
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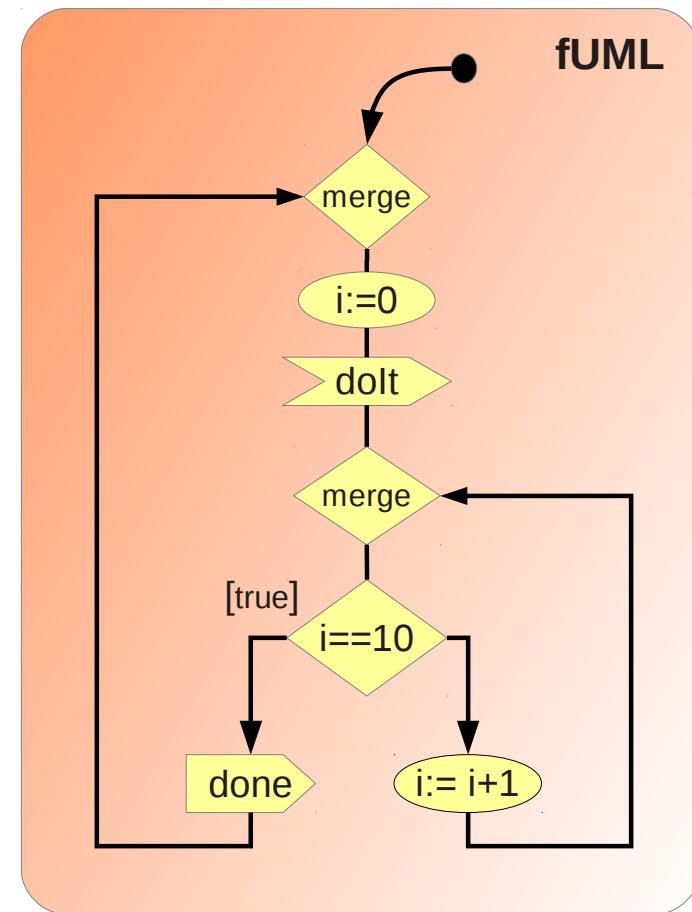
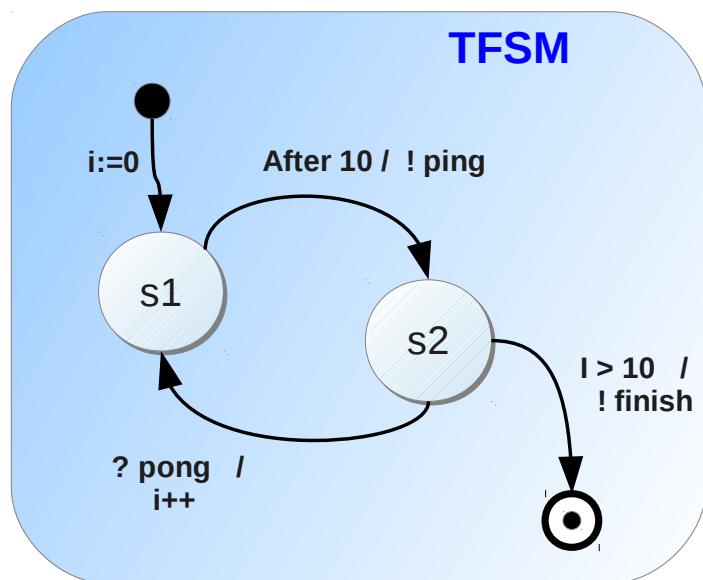


→ Need to explicit the coordination rules,  
for homogeneous and heterogeneous composition

Possibly in an  
analyzable way

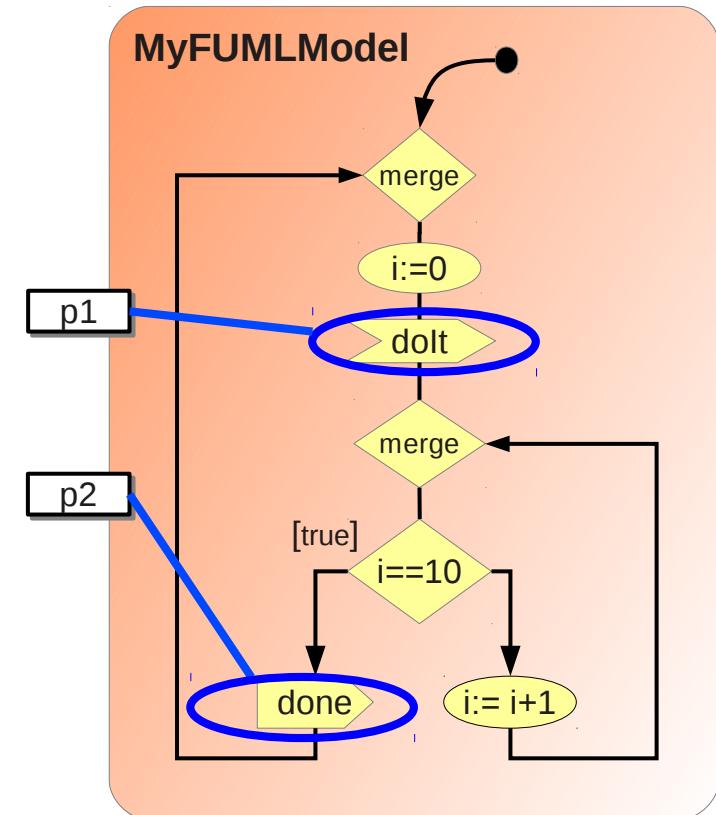
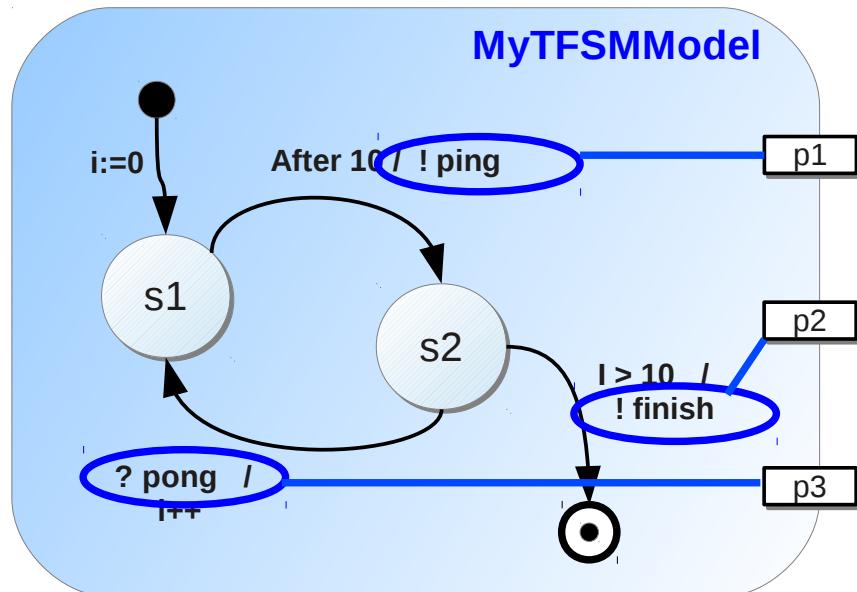
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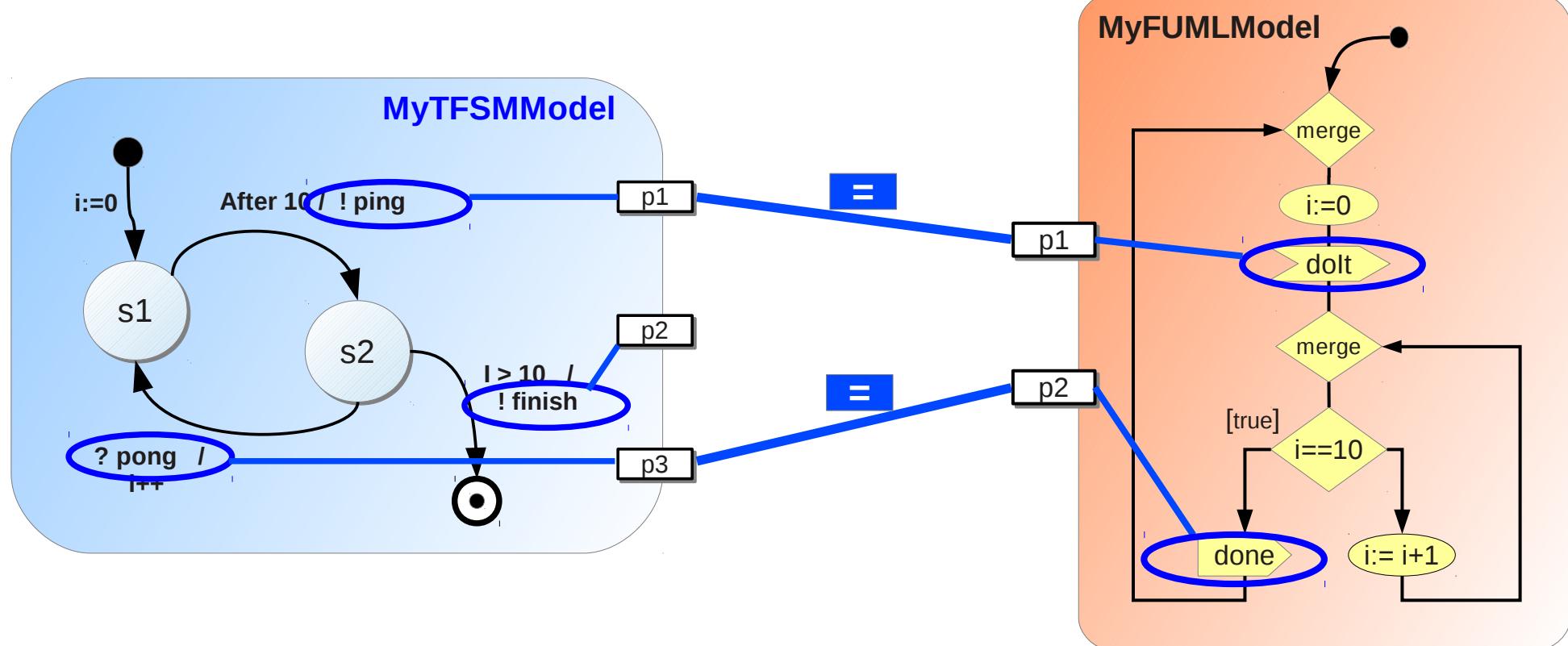
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Instances of Domain Specific Events acts as coordination interfaces

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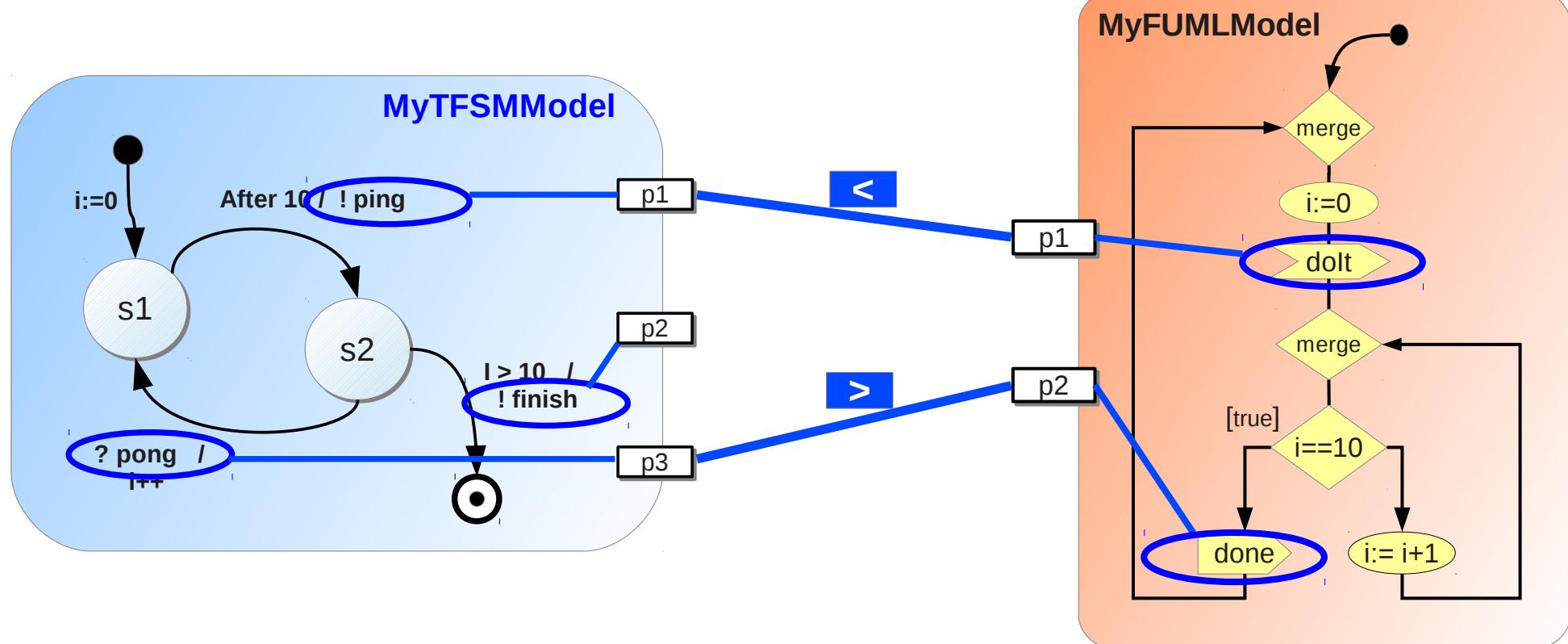
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Instances of **Domain Specific Events** acts as coordination interfaces

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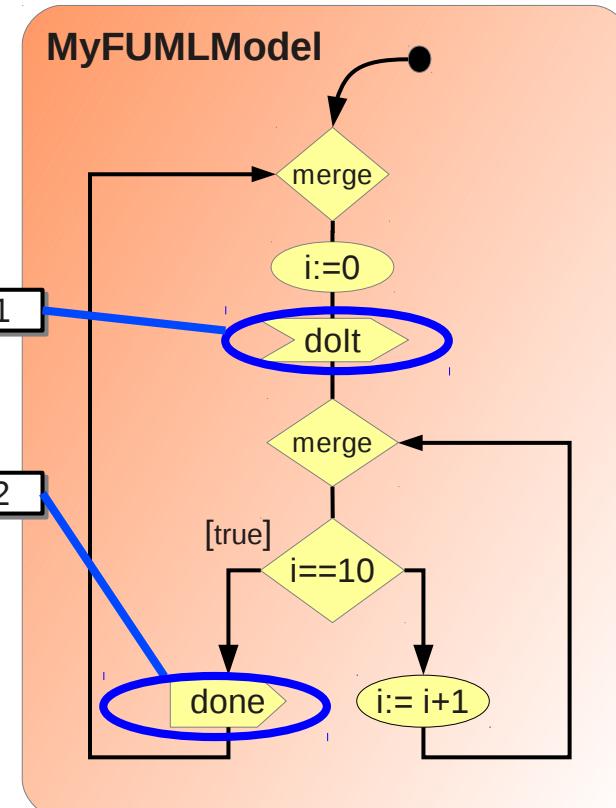
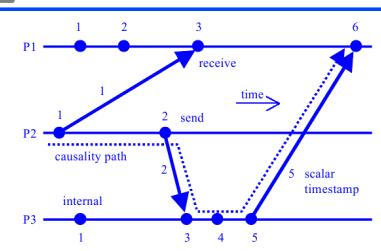
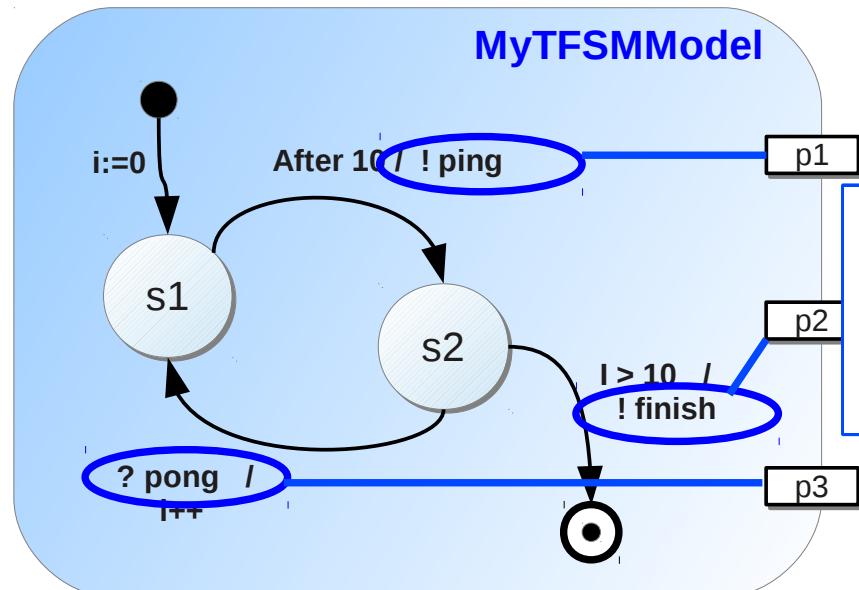
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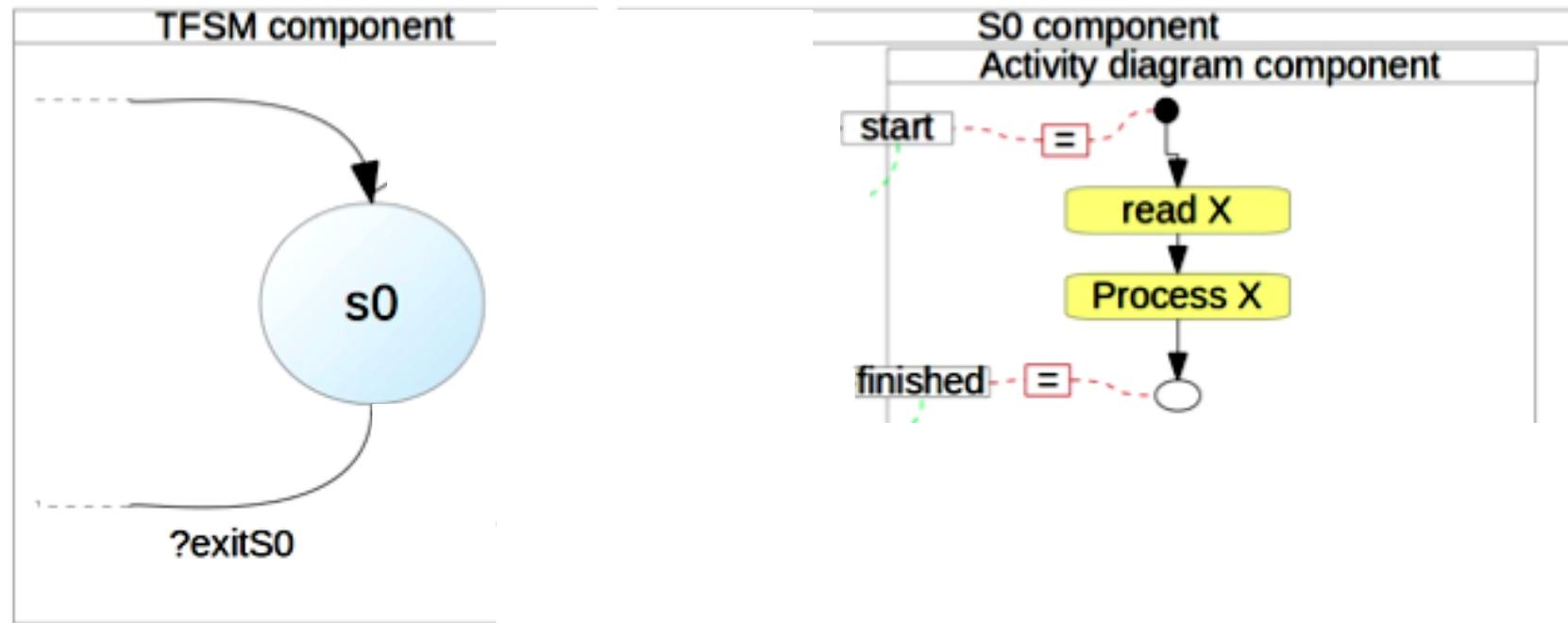
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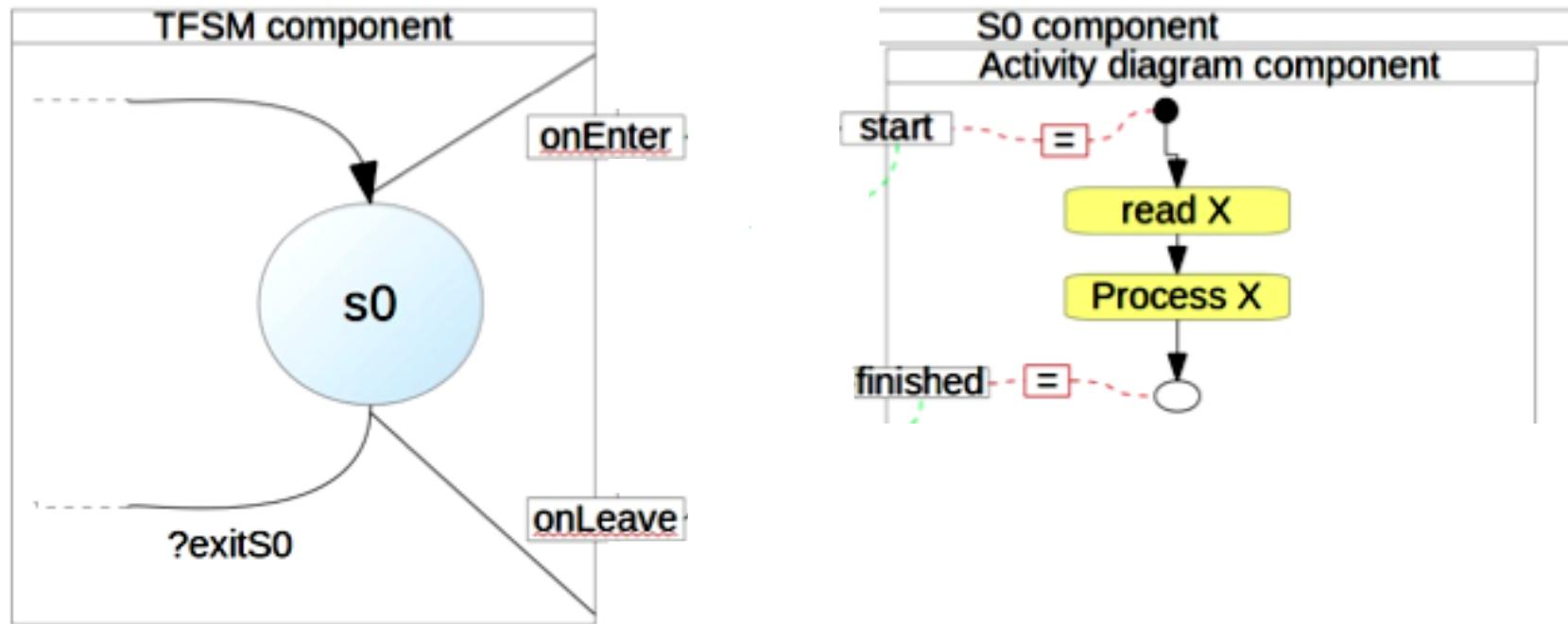
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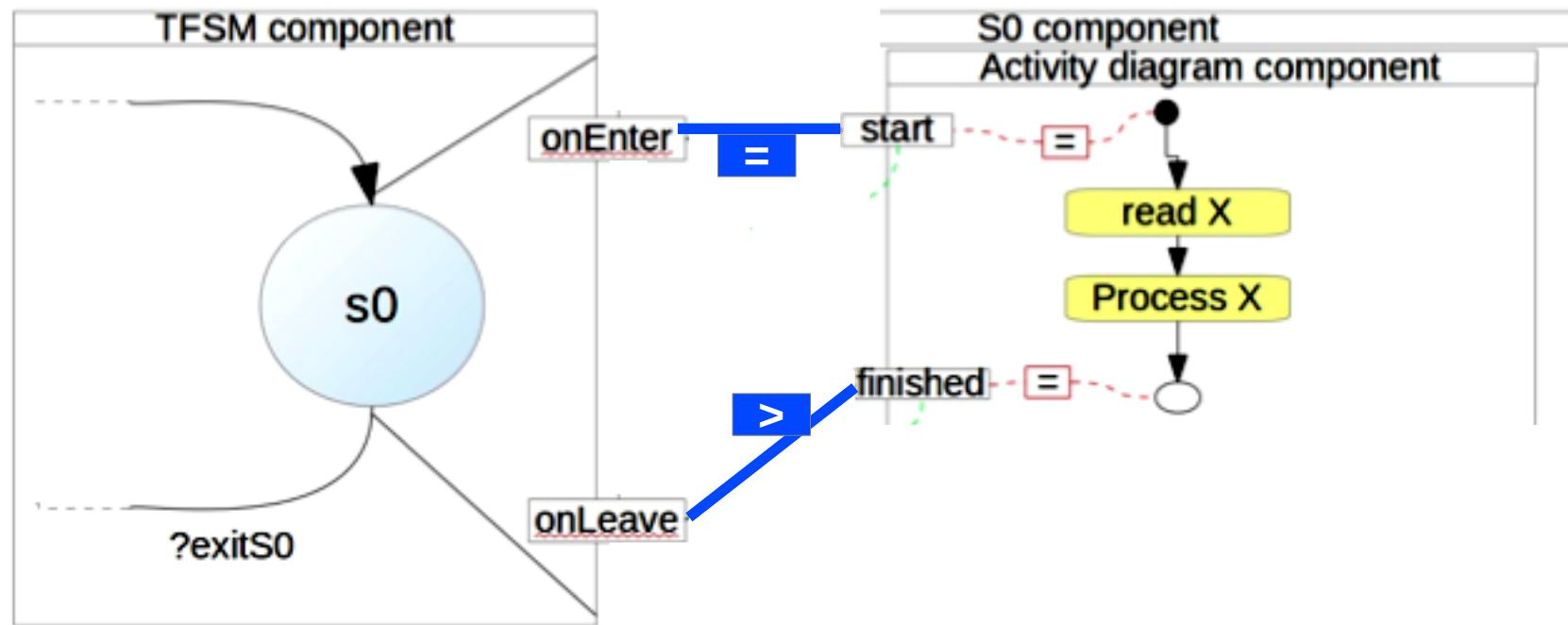
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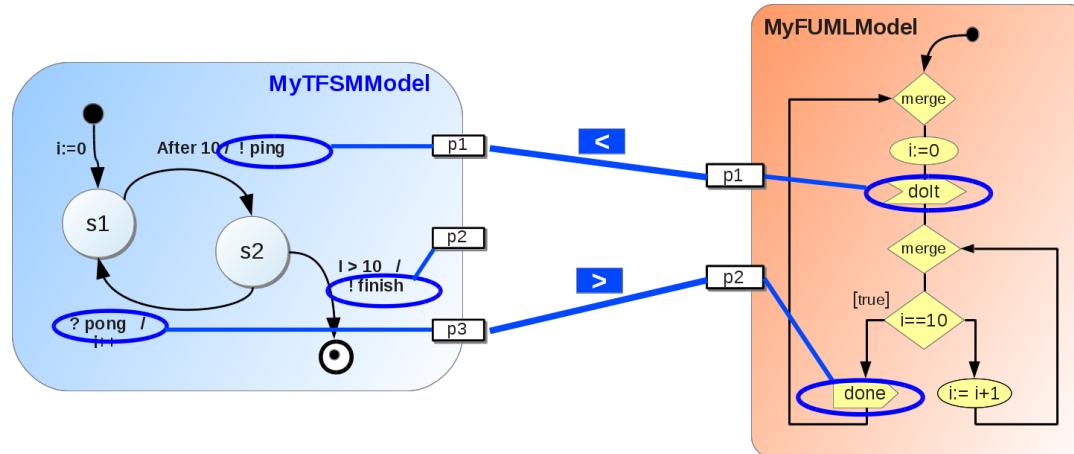
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Instances of **Domain Specific Events** acts as coordination interfaces

# Towards DSML behavioral composition

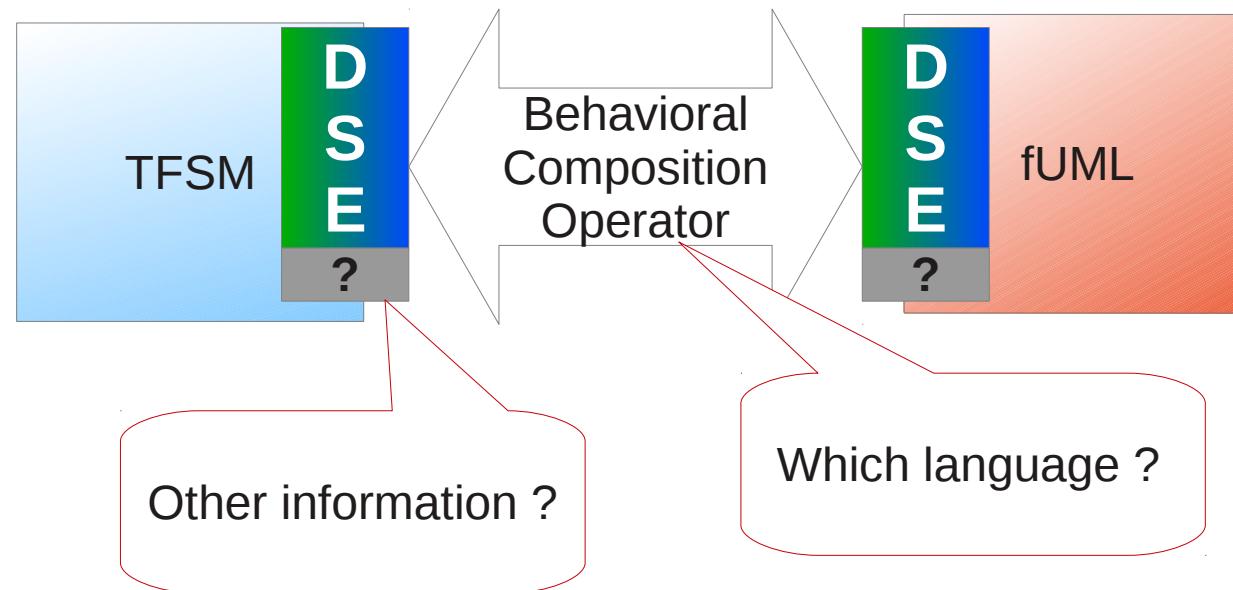
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Domain Specific Events acts like a behavioral interface for composition

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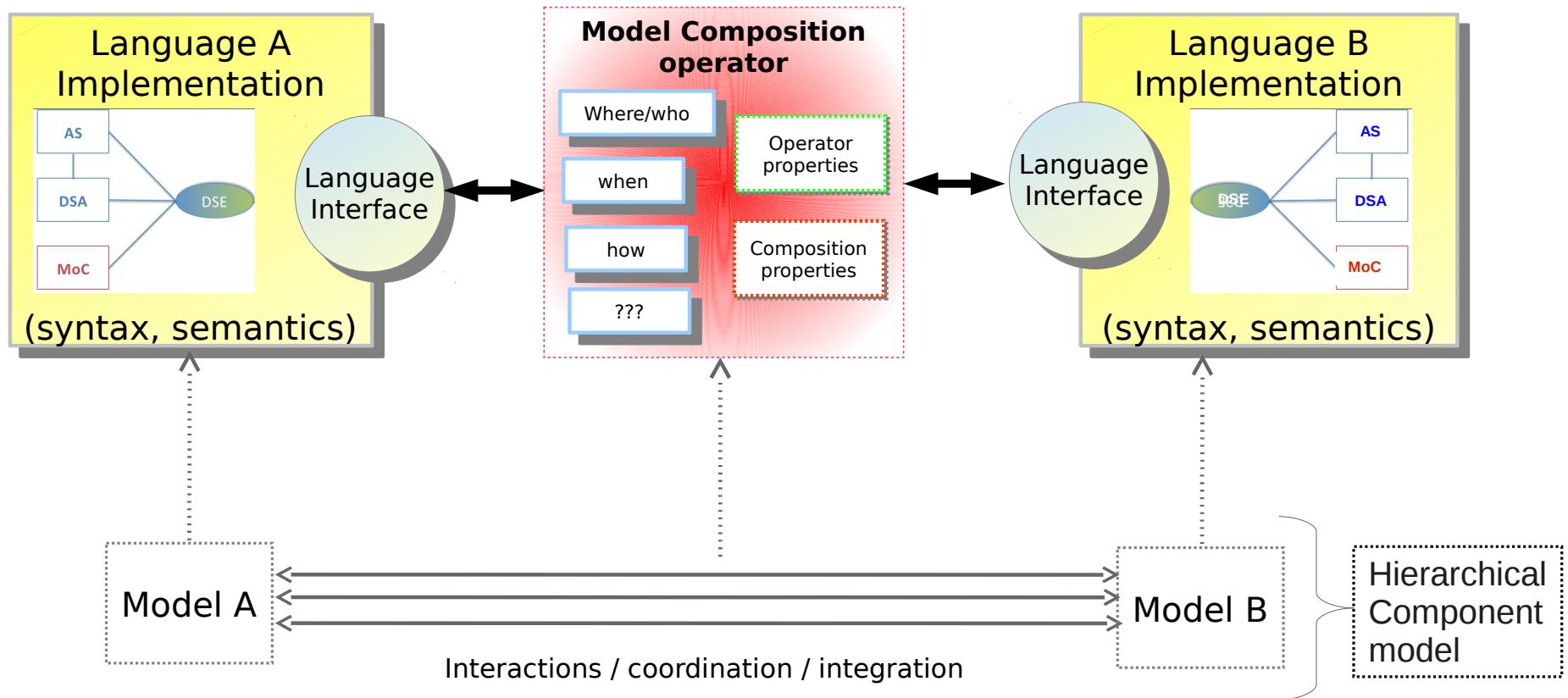
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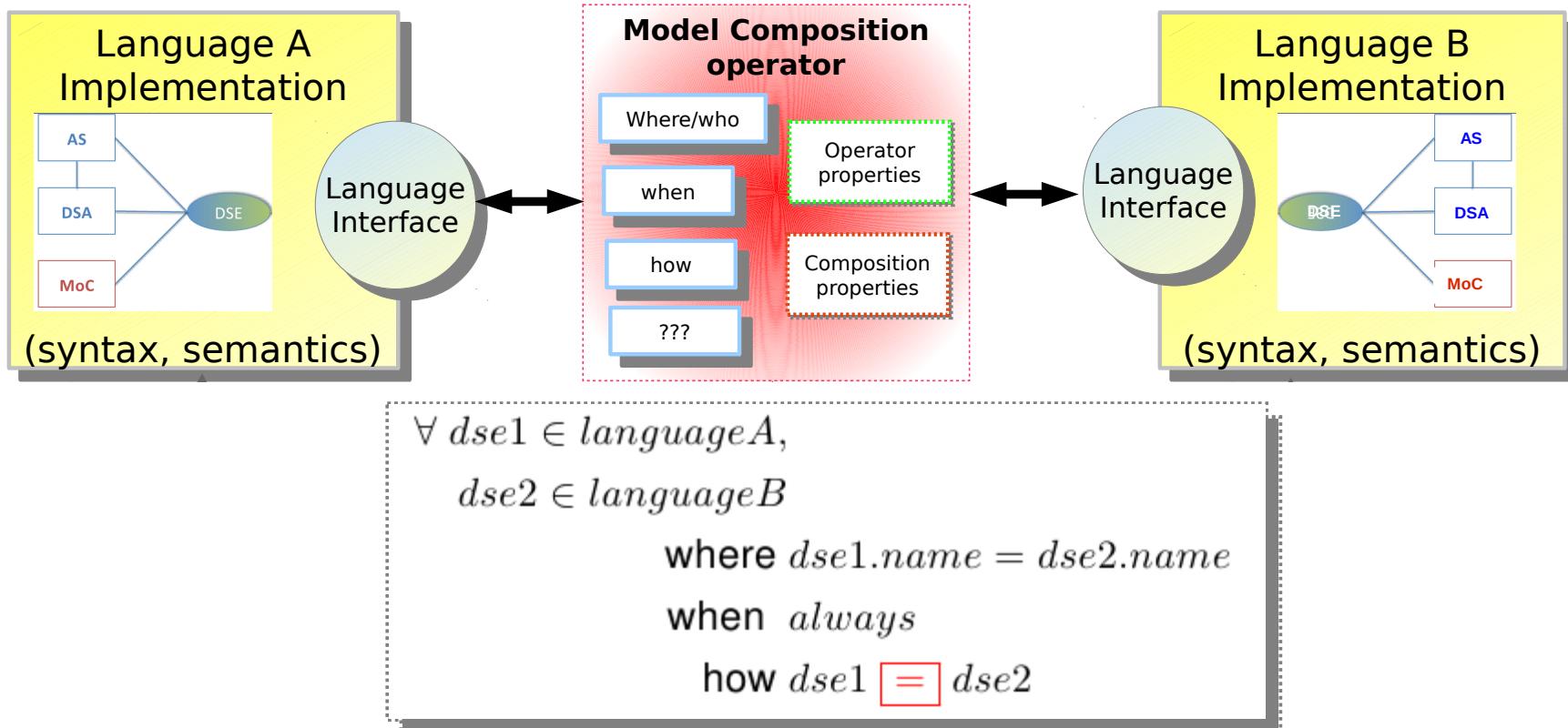
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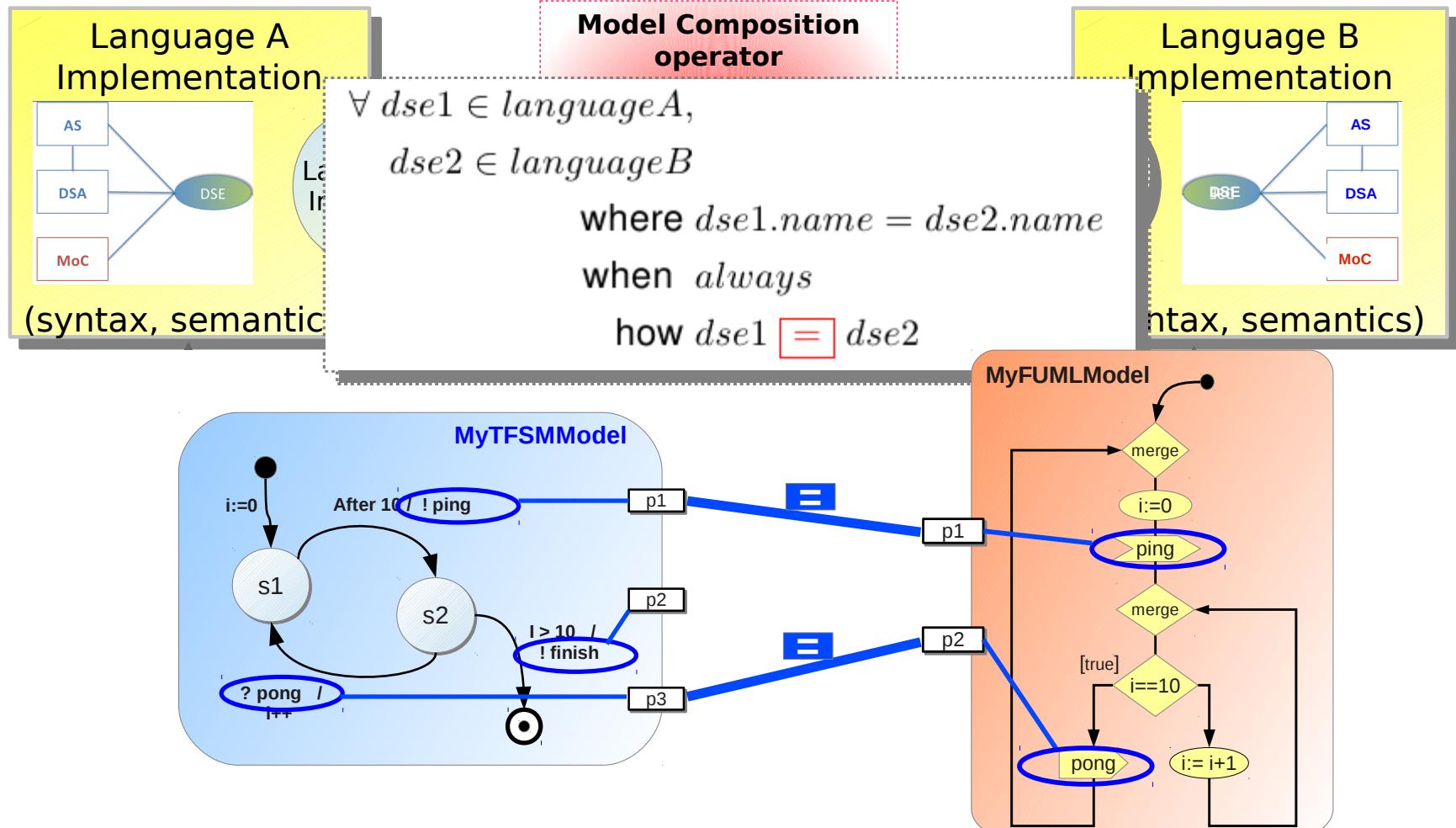
# Towards Composition operators: preliminary studies

- Synchronous product of two languages



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# Thank you

<http://gemoc.org/ins/>

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# Gemoc

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