Using Multi Level Modelling Techniques for Managing Mapping Information

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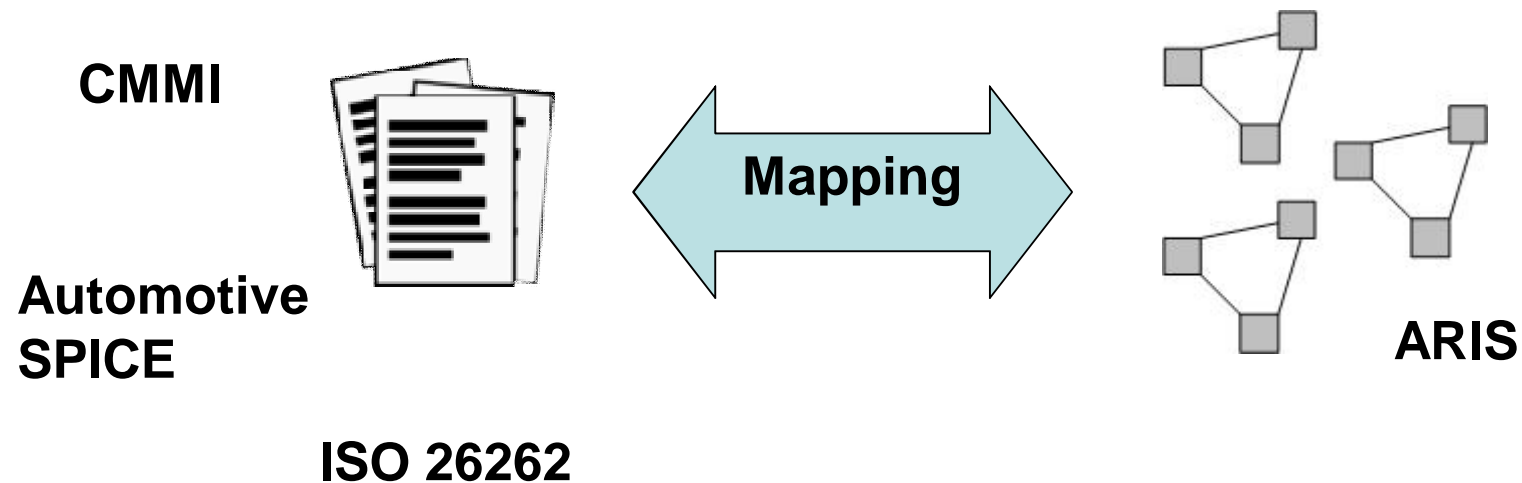
Agenda

Problem Domain

Model Management & Organization

Future Work

Discussion

Problem Statement and Domain Context of Case Study

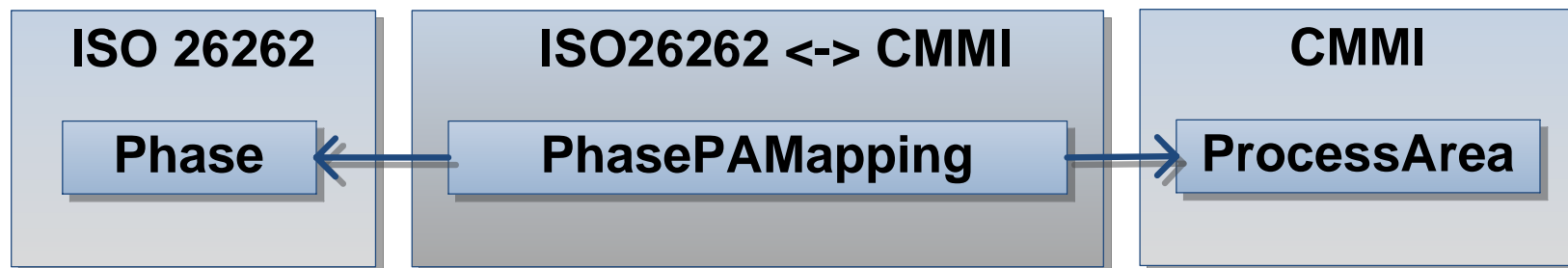Companies need to use development processes that comply to **many** quality standards at the same time

CMMI

Automotive SPICE

ISO 26262

Mapping

ARIS

Problem Statement and D Examples

Tracing between Quality Standards and Dev. Processes

ISO 26262	ISO26262 <-> Dev. Process	Dev. Process
Phase	**PhaseTaskMapping**	**Task**

Tracing between Quality Standards

ISO 26262	ISO26262 <-> CMMI	CMMI
Phase	**PhasePAMapping**	**ProcessArea**

Solution
Build a model that organizes information
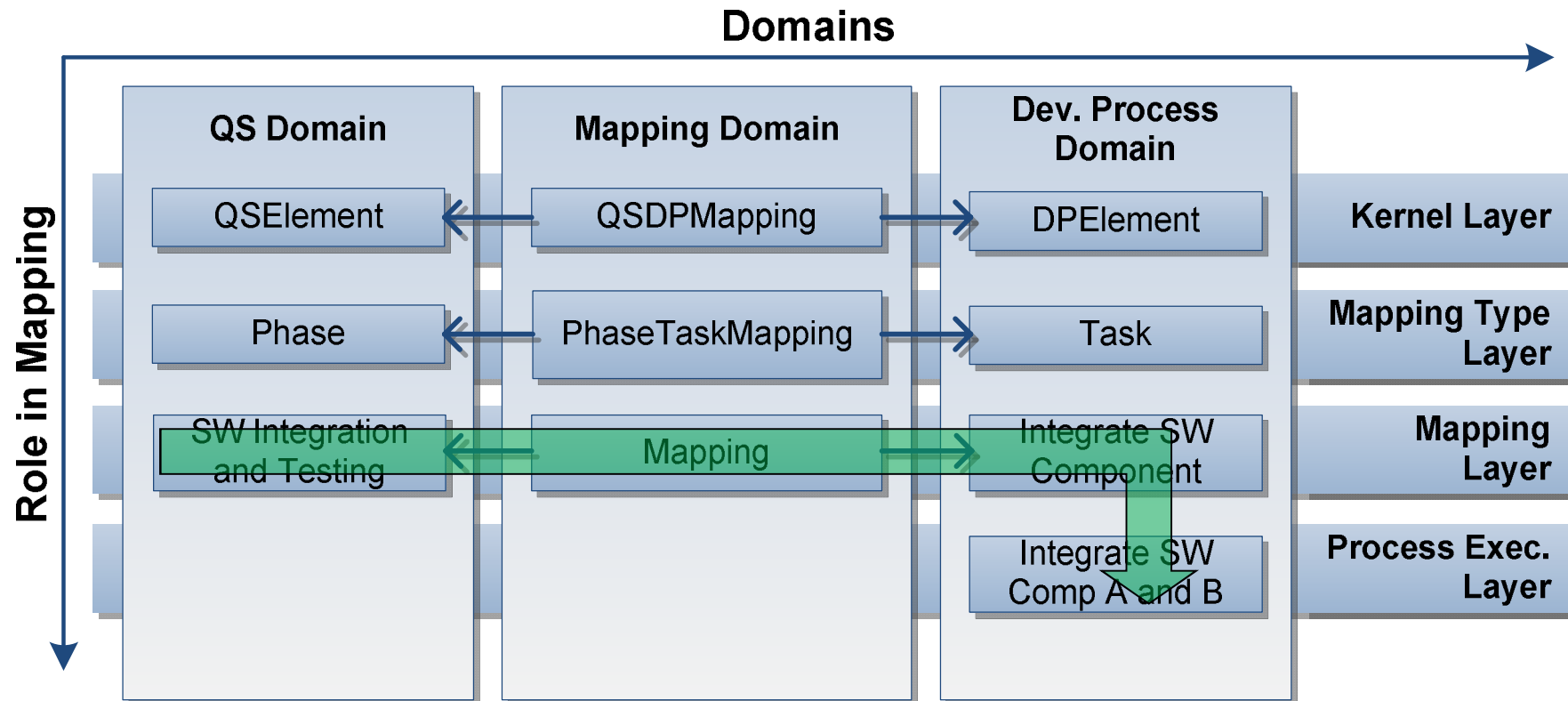
Domains

→ *A natural realization of this architecture greatly benefits from having more than the two traditional class + object layers*
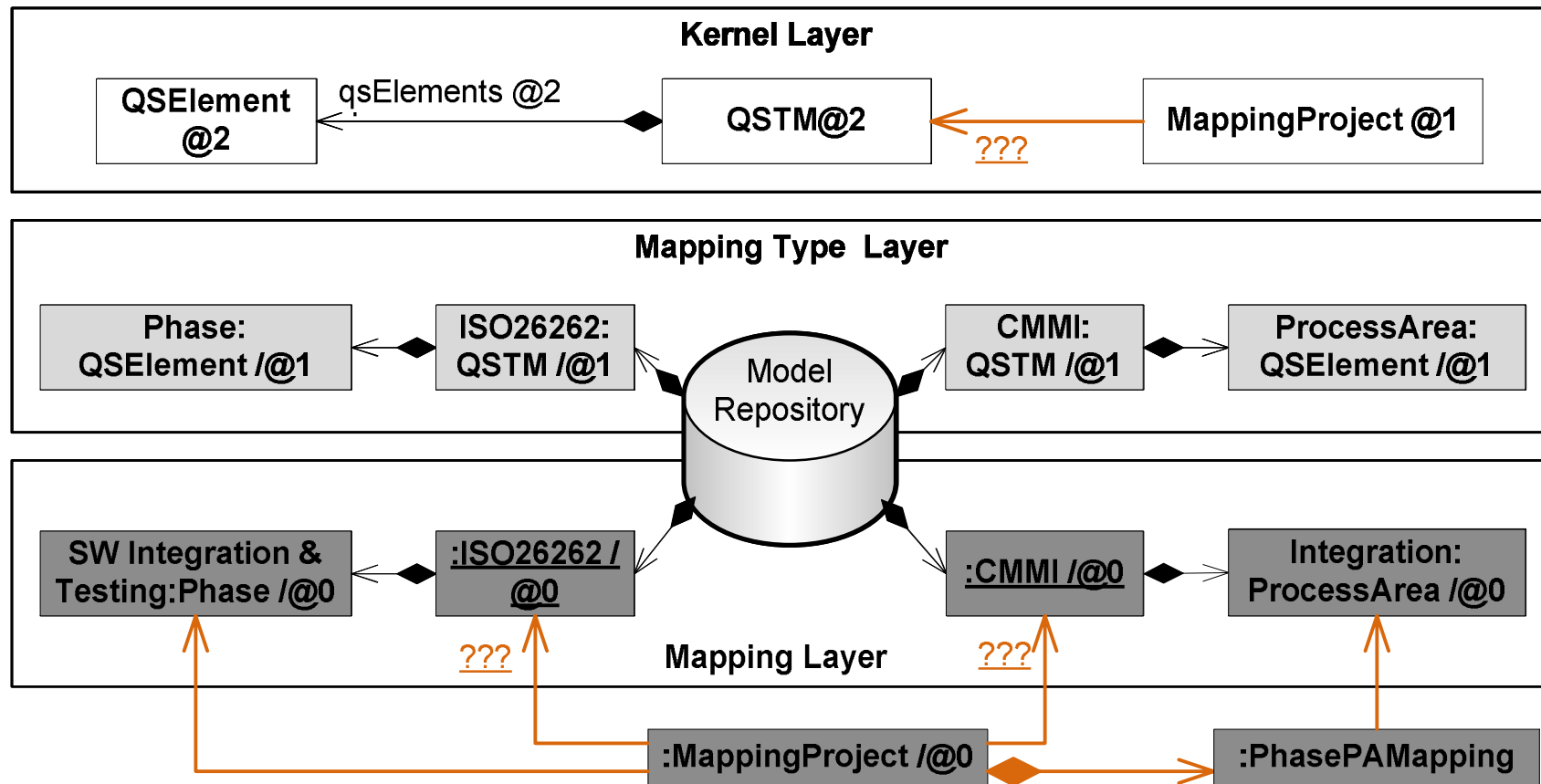
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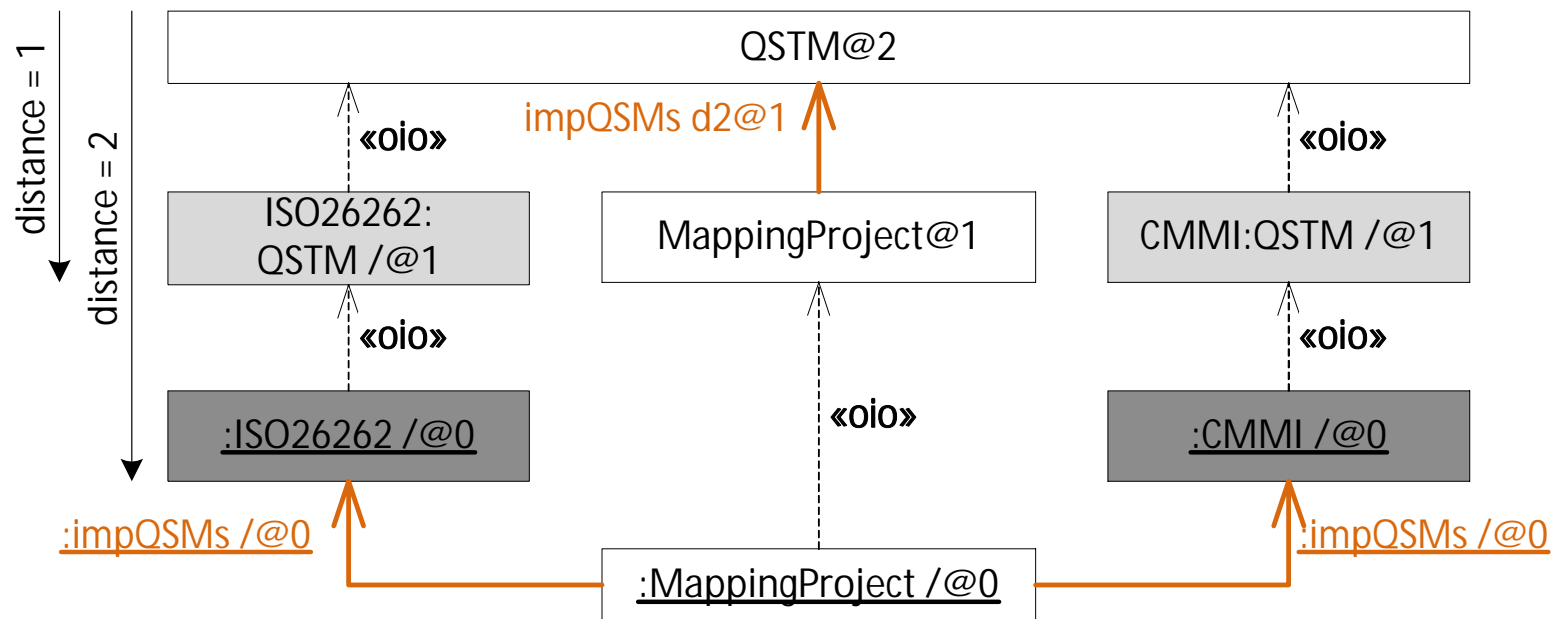
Model Management
Central Repository to facilitate reuse

Model Management
Level Crossing References

Level Crossing references are allowed when specifying a distance d

d = #ontological instantiation steps between clabjects A and B

➔ *A Mapping project may import any quality standard!*

Model Management
Restricting References

Motivation

Managing models in a central repository for reuse requires clear rules for model content

Examples:

No direct references between elements from the QS and DP domain

➔ Mappings are used to decouple these models from each other

Quality standard models must not contain elements from the DP or Mapping Domain

➔ Models should only contain elements from their domain

Solutions

Introduce domains as first level modelling concept for restricting references

Model Management
Restricting References

An Element may belong to a domain (including its ontological instances)

➔ References are only allowed to **connected** domains

➔ May be further restricted with respect to containment

{ refAllowed=True; containmentAllowed=False }
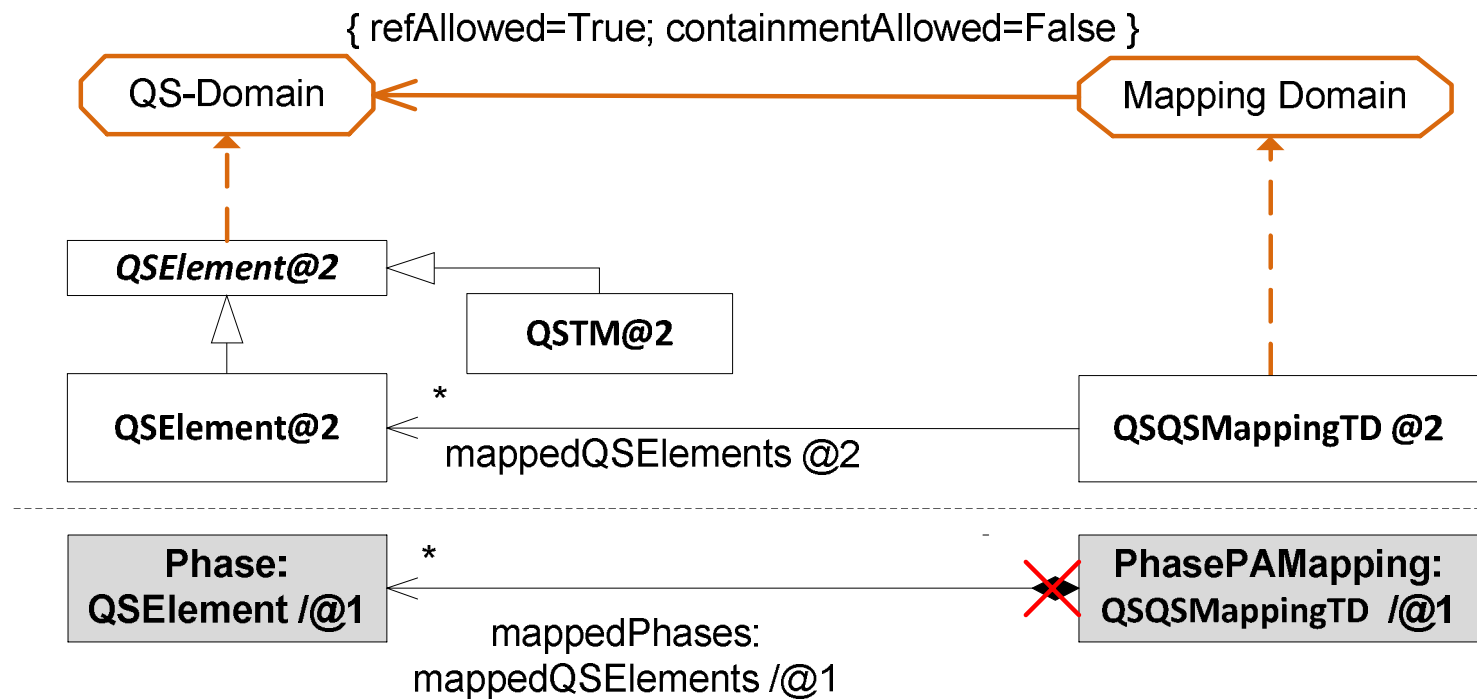
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Future Work

We are working / planning to continue our work in the following directions:

- Enhance DeepML infrastructure (in development)
  - Code Generation (in development)
  - Diagram Based Editors (in development)

- Enhancement of the tracing application – called PIQSH-SC (Process Improvement and Quality Standard Harmonization Support Center – under development)

- Consider process execution as fourth layer (in concept phase)

Thank you very much for your attention!

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