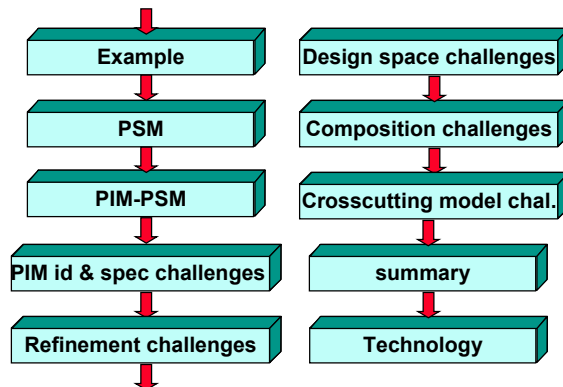


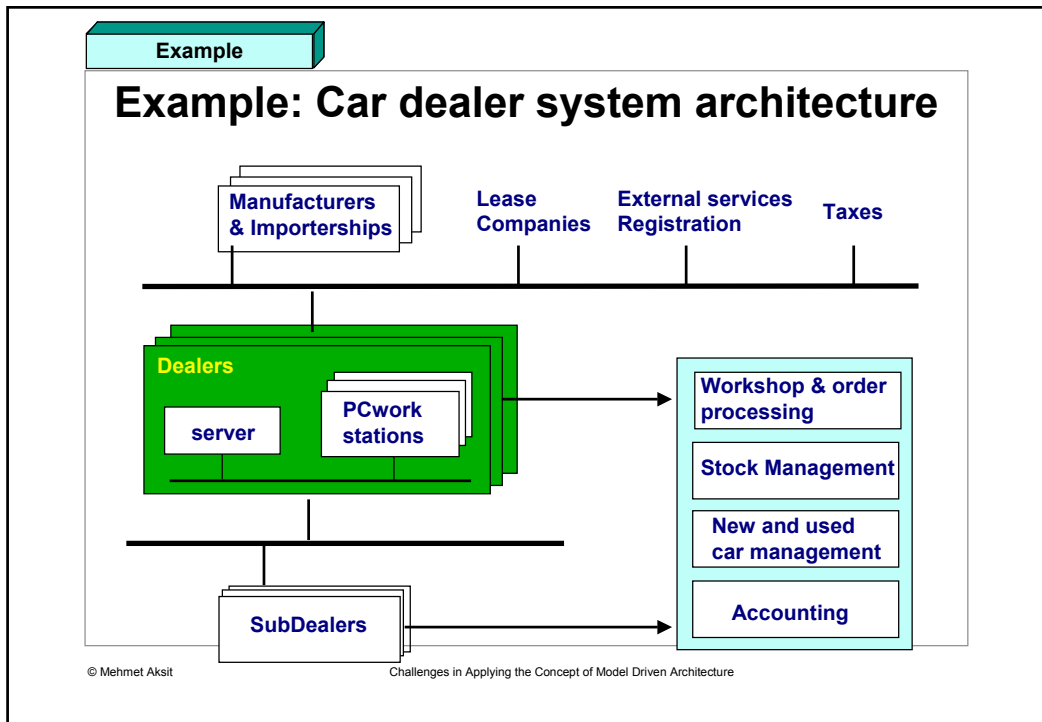
Challenges in Applying the Concept of Model Driven Architecture

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P.O. Box 217
7500 AE Enschede, The Netherlands
aksit@cs.utwente.nl
<http://trese.cs.utwente.nl>

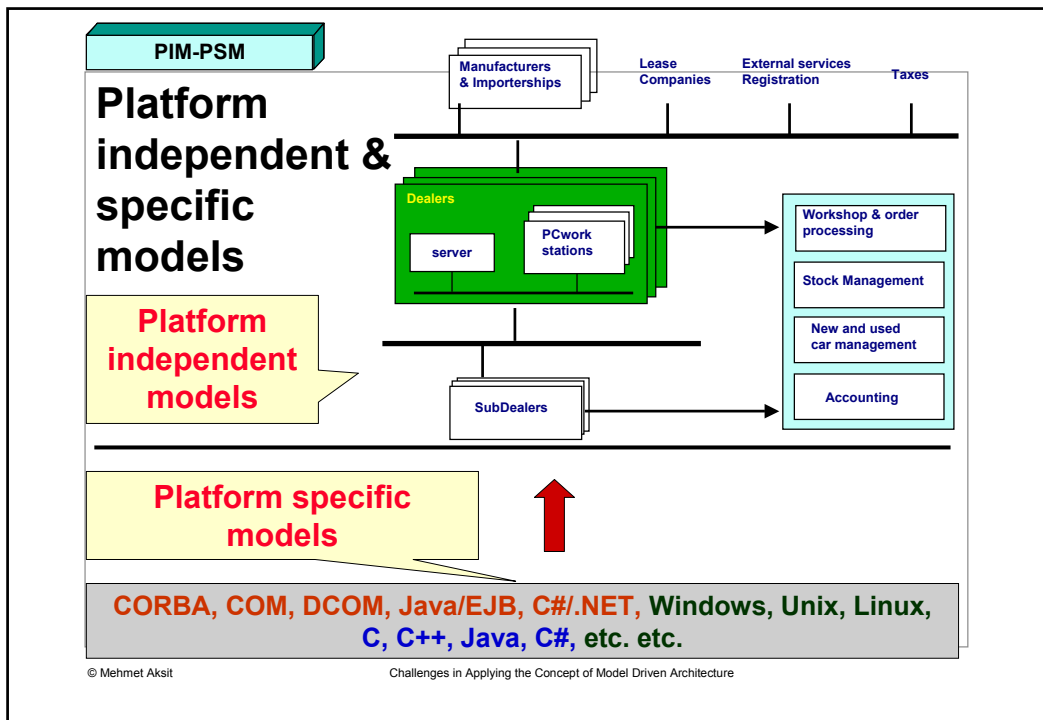
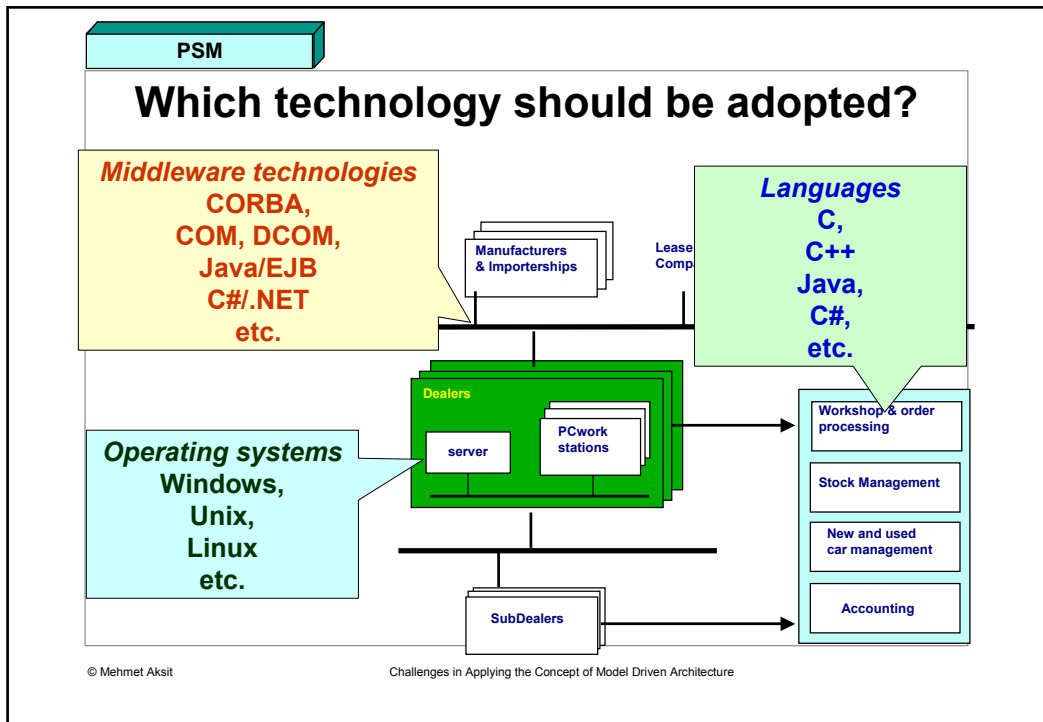
There is an MDA Working group
THE DUTCH MDA GROUP,
Which Discusses Various MDA Related Issues:
Send email to: mda@cs.utwente.nl

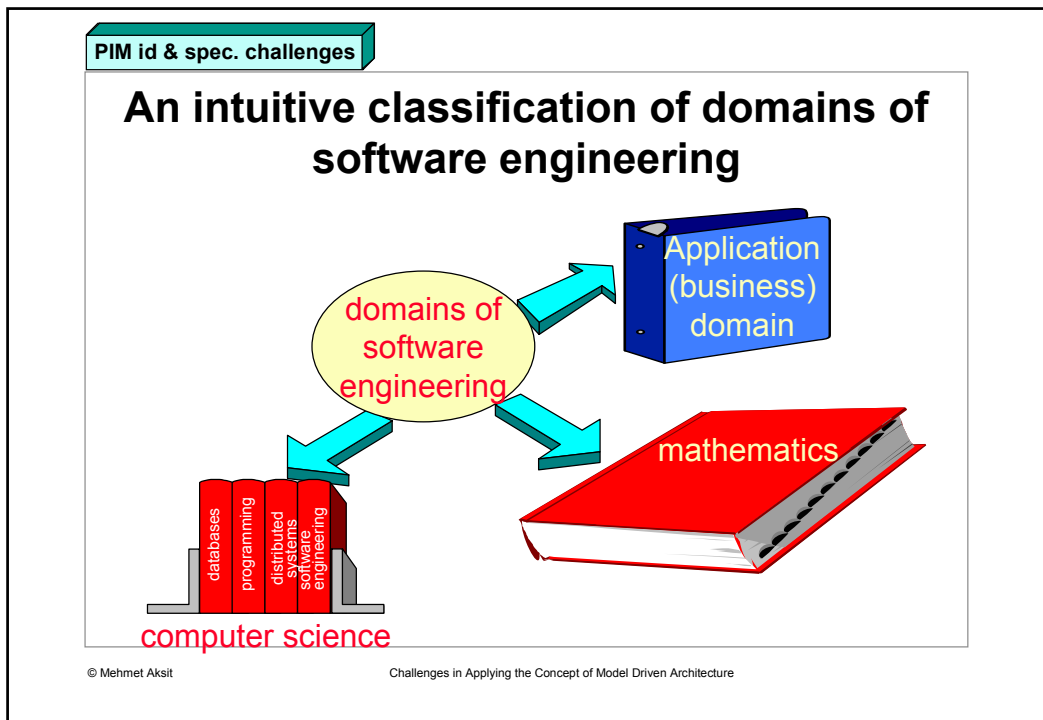
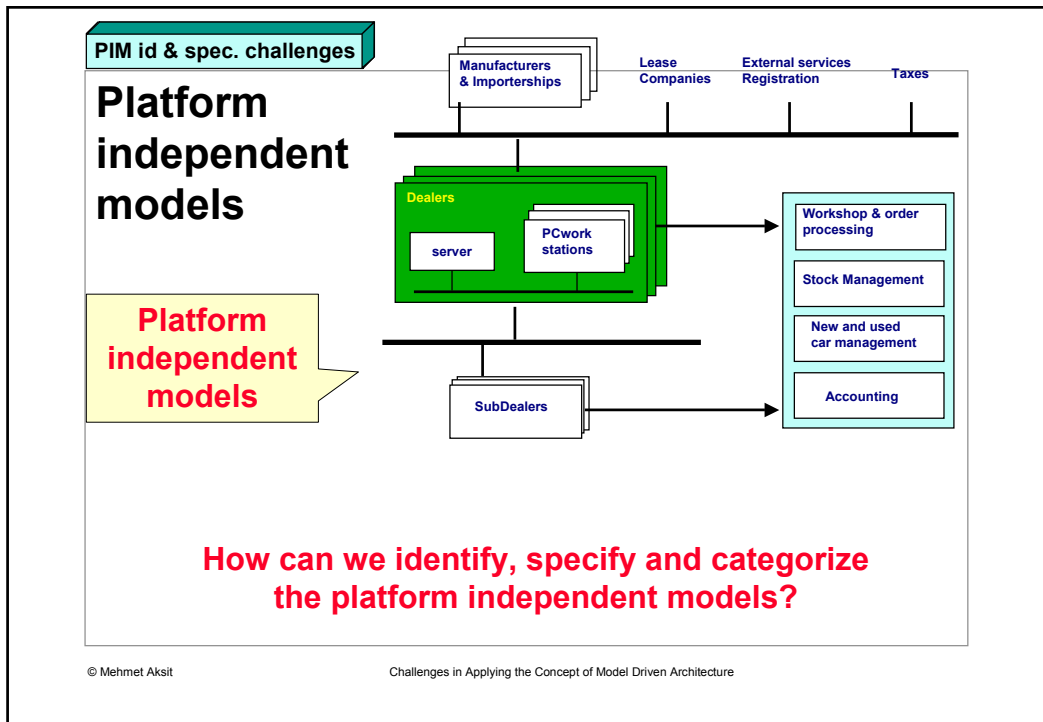
Table of contents

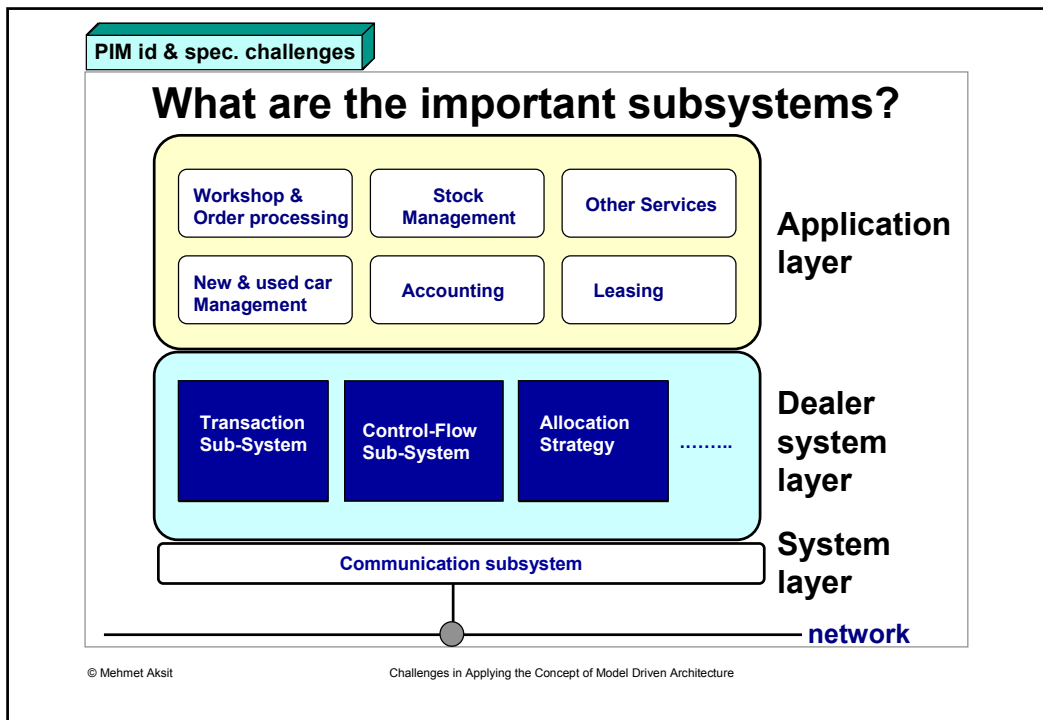
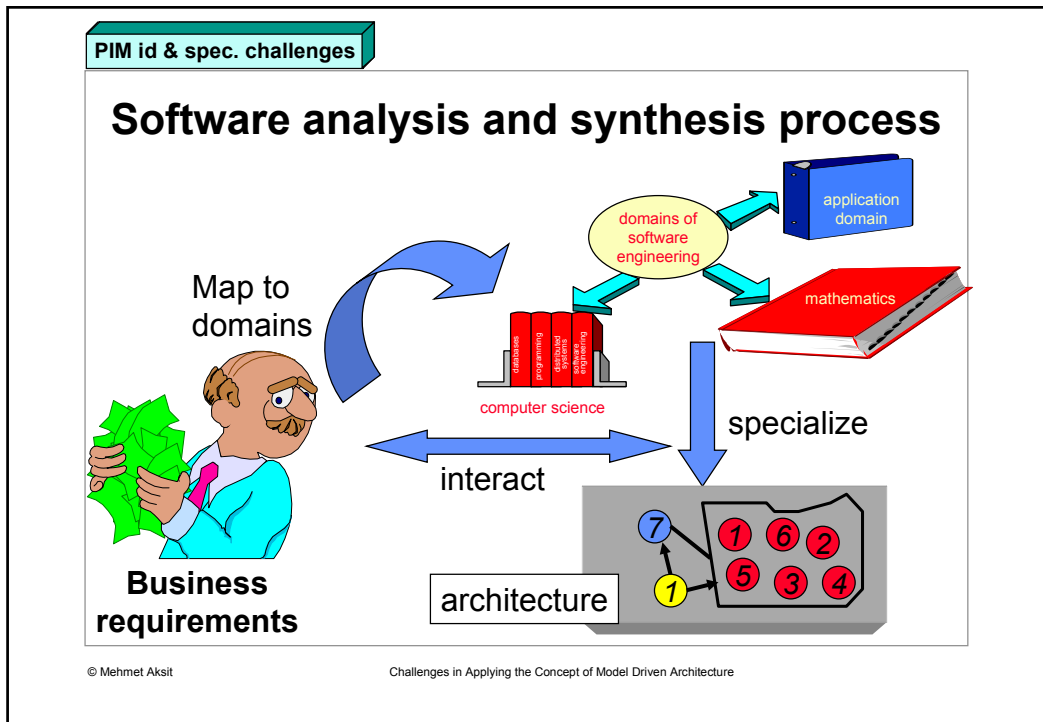


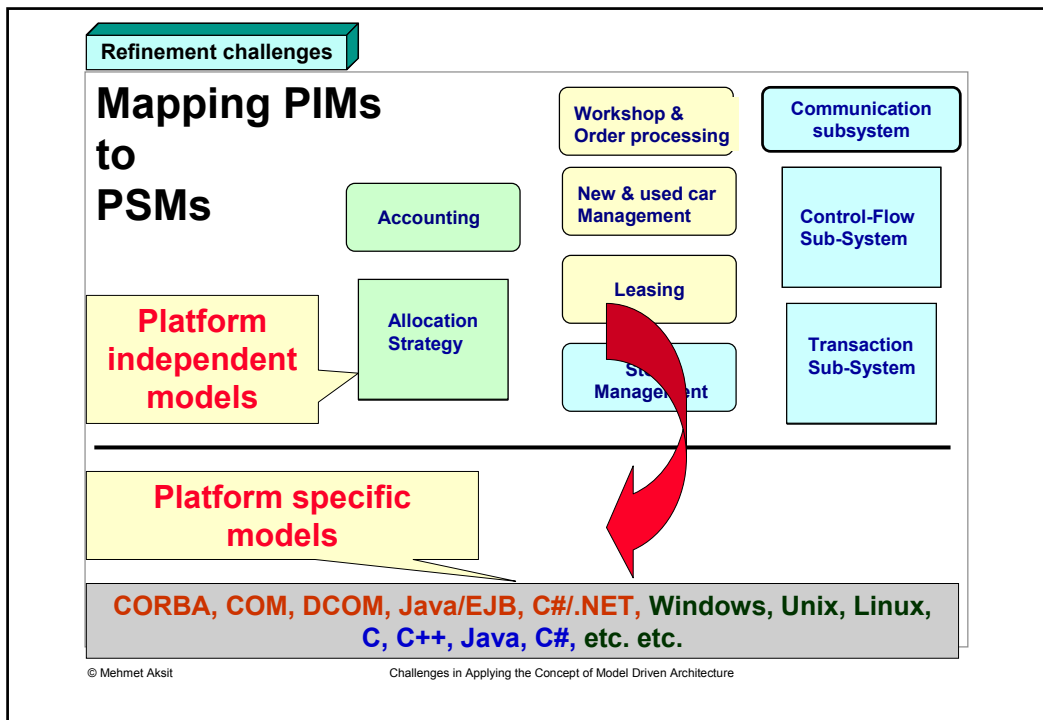
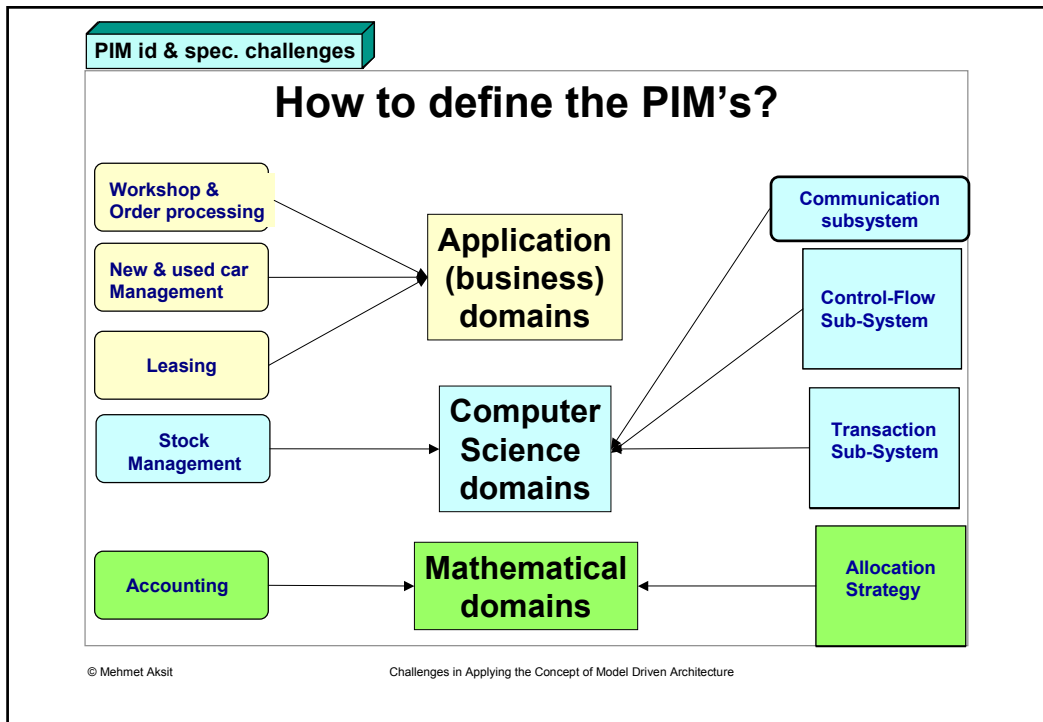


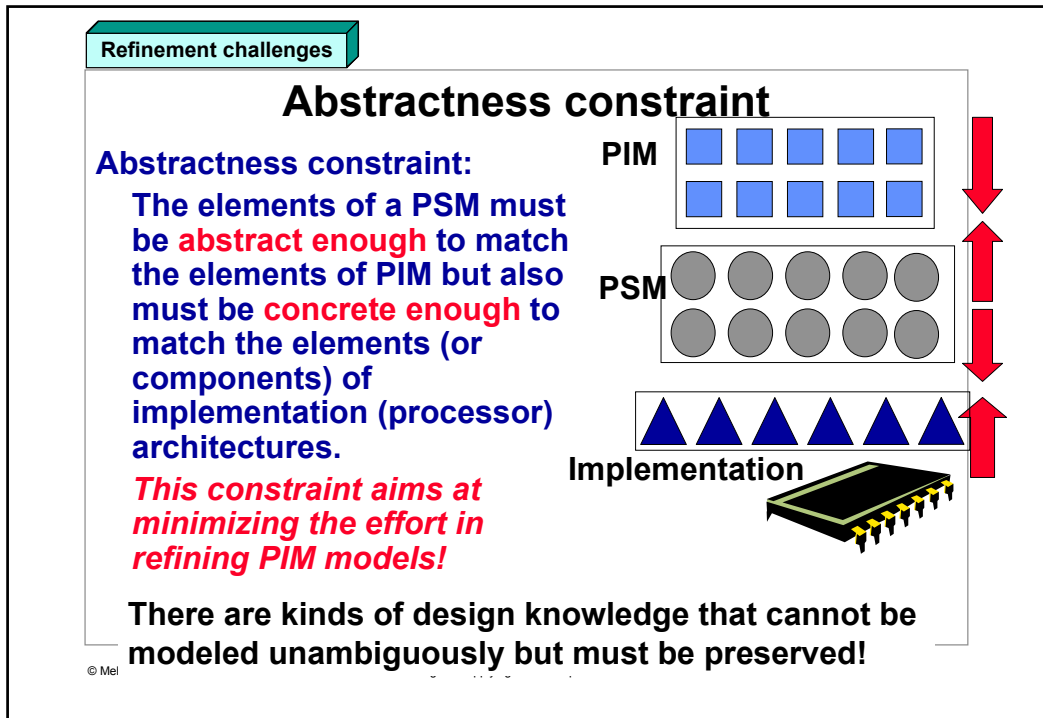
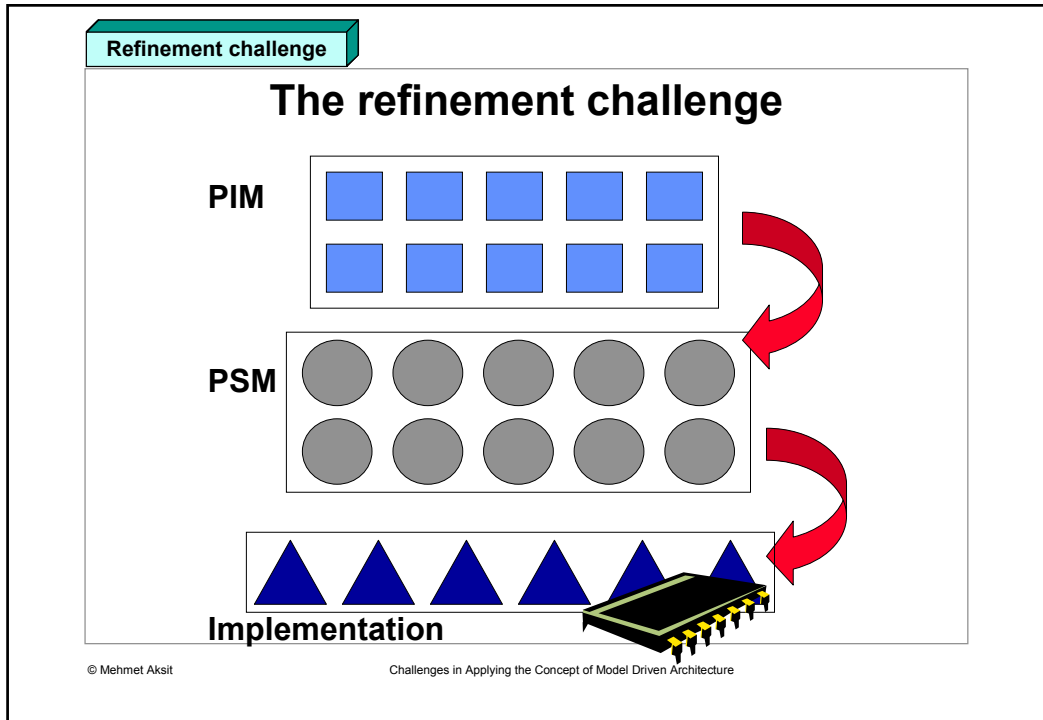
- Example**
- ## Important concerns
- ✓ The company should keep its **leading** position;
 - ✓ Different **countries & languages** should be supported;
 - ✓ **Different** cars with **different** maintenance schemes, **different** registration & insurance laws, should be supported;
 - ✓ Various **software/hardware platforms** should be supported;
 - ✓ The software architecture must be **dynamically scalable**: single dealer, single distributed dealer, regional, across countries;
 - ✓ The architecture should provide **cost reduction** through sharing across the network;
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Refinement challenges

Standardization constraint

Standardization constraint:
 Elements of implementation architectures must be **standardized** to ease **sharing** among multiple PIMs but must be **different** enough to match the needs of multiple PIMs.

This constraint aims at reducing costs through sharing implementations of PIMs.

PIM

PSM

Implementation

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Refinement challenges

Example: transaction sub-system

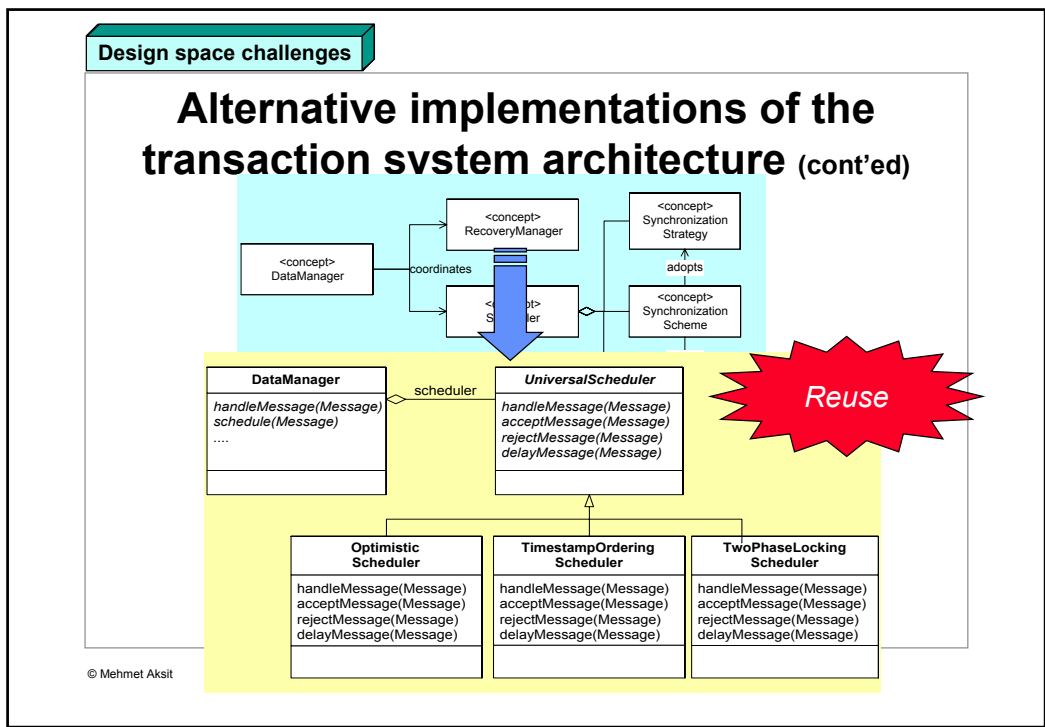
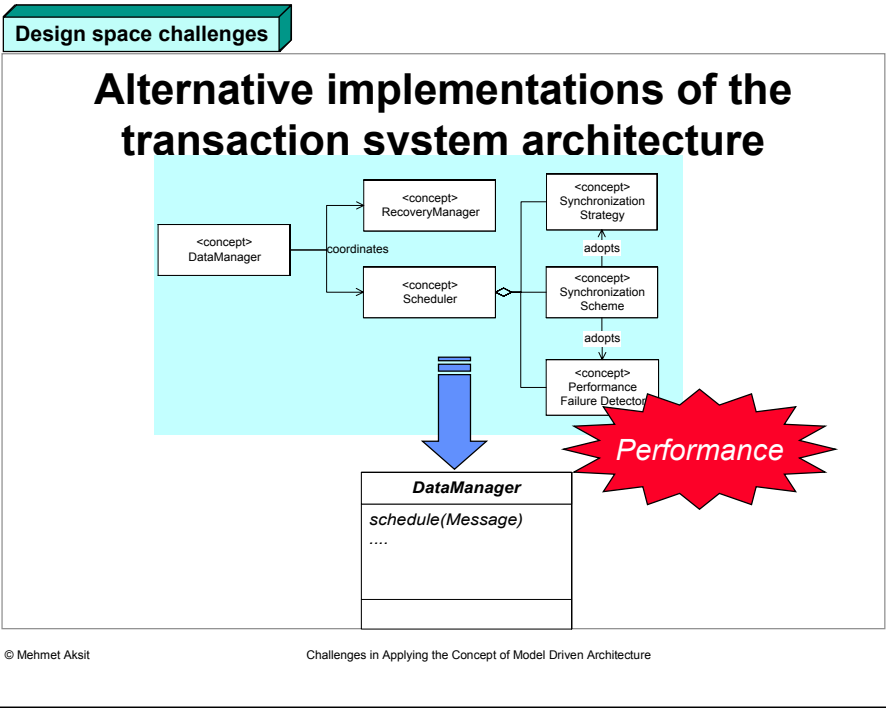
Transaction Sub-System

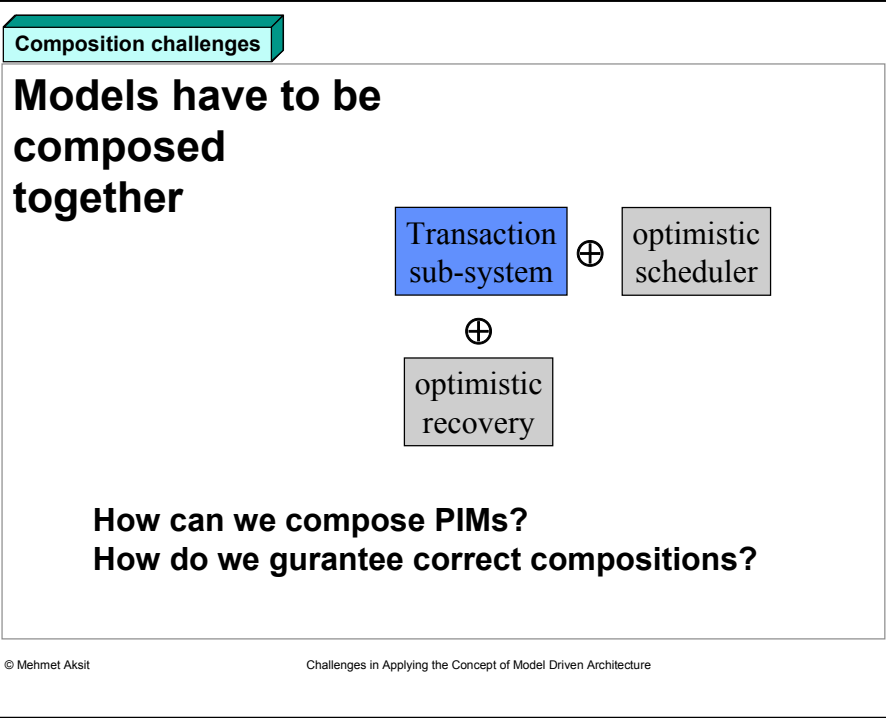
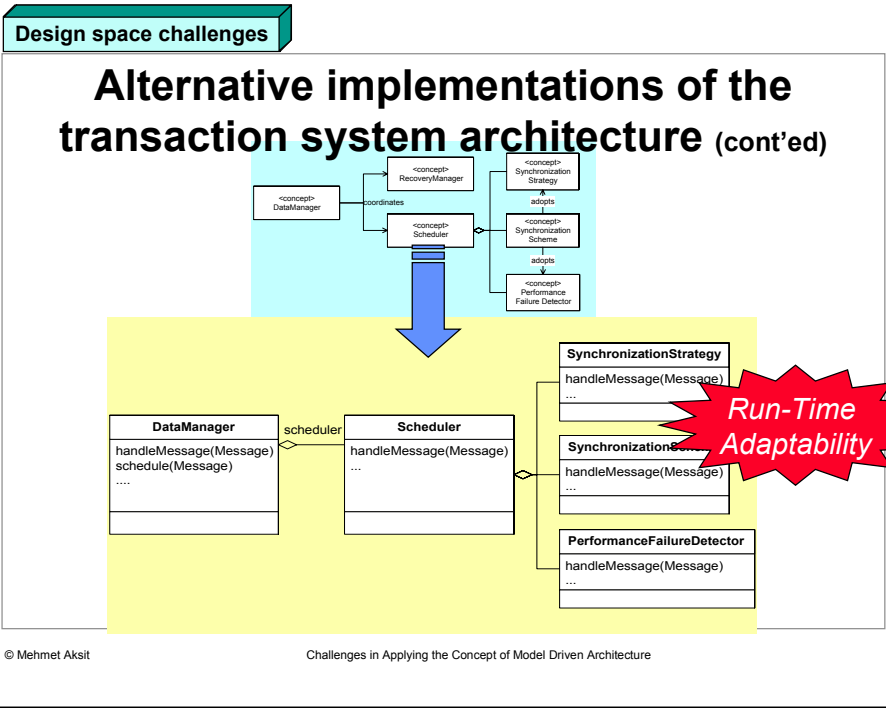
Platform independent models

Platform specific models

CORBA, COM, DCOM, Java/EJB, C#.NET, Windows, Unix, Linux, C, C++, Java, C#, etc. etc.

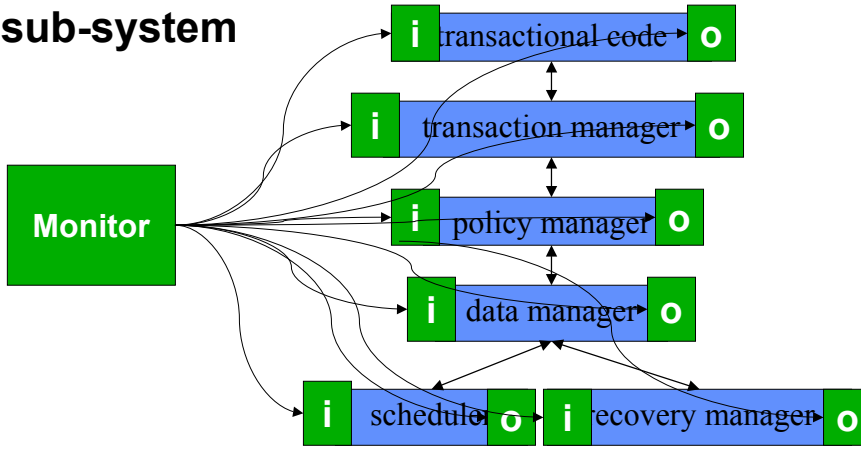
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Crosscutting challenges

Monitoring the transaction sub-system



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Summary

Summary of the challenges

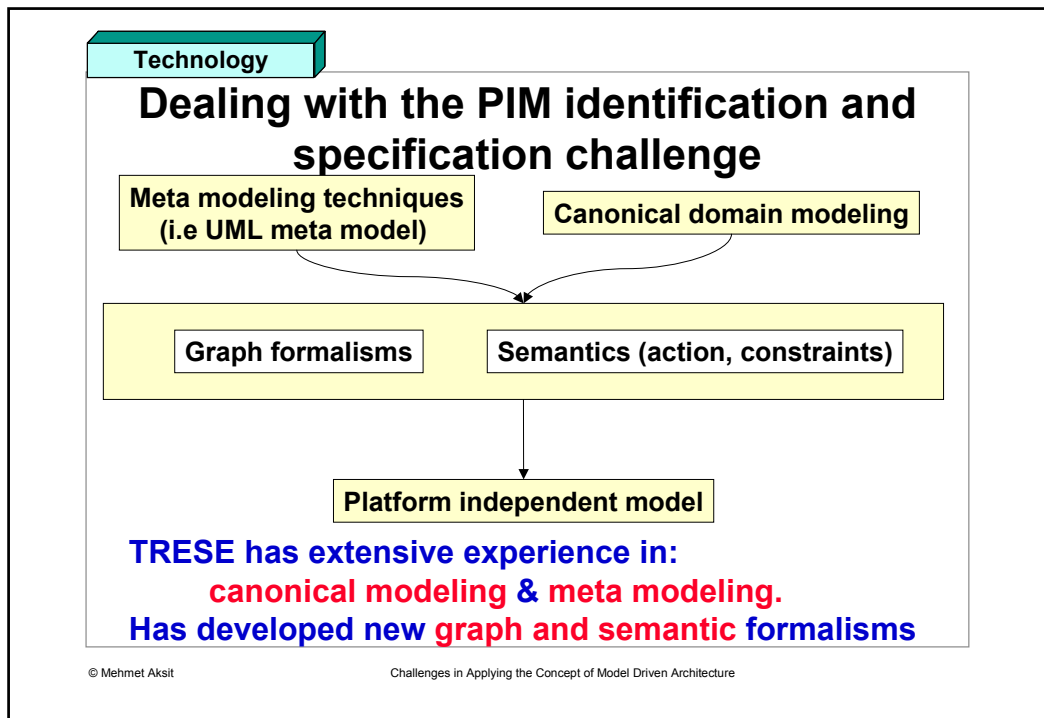
- PIM **identification and specification** challenges;
- PIM **refinement** challenges: **abstractness** constraint & **standardization** constraint;
- Managing design & implementation **space** challenges;
- Correct **model composition** challenge;
- Managing **crosscutting concerns** challenge;

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Part 2

Techniques in coping with the challenges



Technology

Dealing with the design space management challenge

```
graph TD; Mi[Model i] --> Mk[Model k]; Mj[Model j] --> Mk;
```

TRESE has developed new techniques for model transformations and refinements:
design algebra: for refining & merging models
intelligent fuzzy-logic and agent based tools

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Technology

Dealing with the managing crosscutting concerns challenge

```
graph LR; Mi["Model i (aspect)"] --> Mj1["Model j1"]; Mi --> Mj2["Model j2"]; Mi --> Mj3["Model j3"]; Mi --> Mj4["Model j4"]; Mi --> Dots["....."]; Mi --> Mjn["Model jn"];
```

TRESE has developed new techniques:
for aspect composition & superimposition
based on composition-filters

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Conclusions

TRESE has experience and research interest in:

- **Meta modeling**
- **Canonical modeling**
- **Graph formalisms, constraints & action semantics;**
- **Model transformations**
- **Superimposition (for crosscutting aspects)**
- **Code generation**