SysML v1 to v2 Transformation
Model Refactoring: Principle & Status

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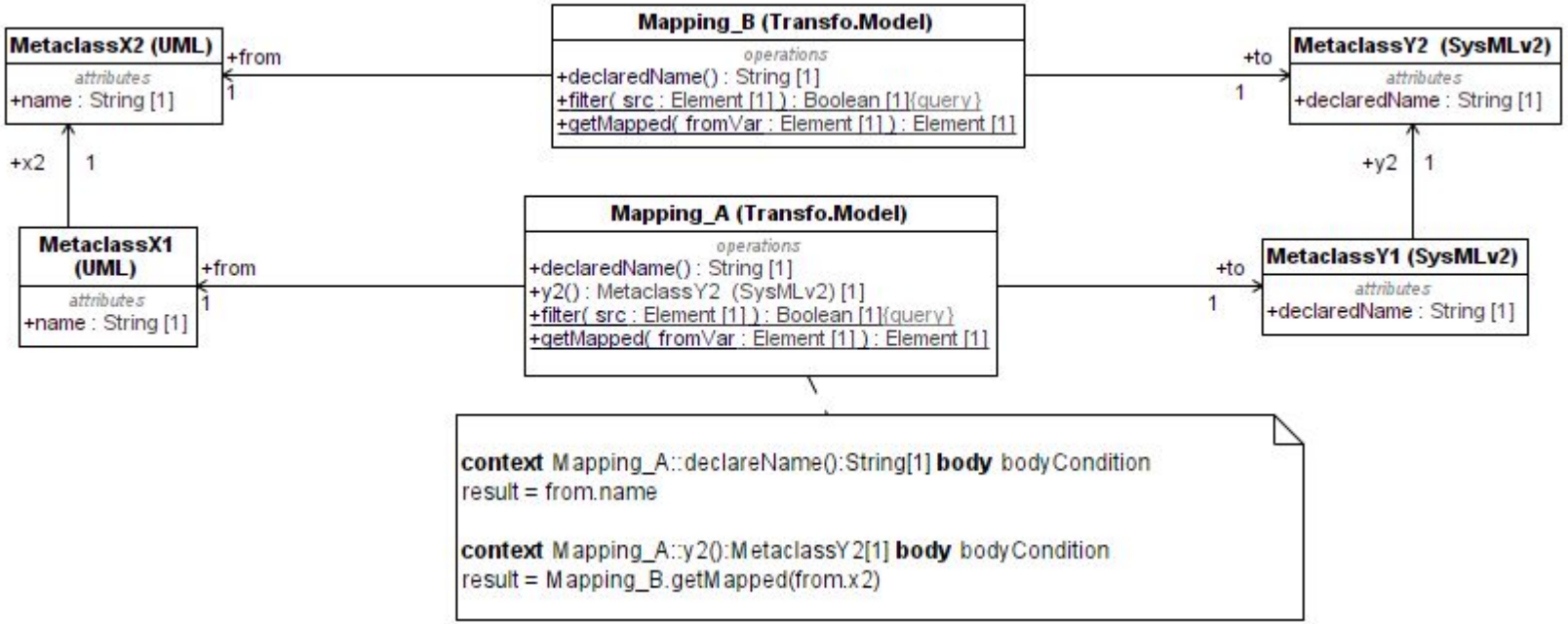
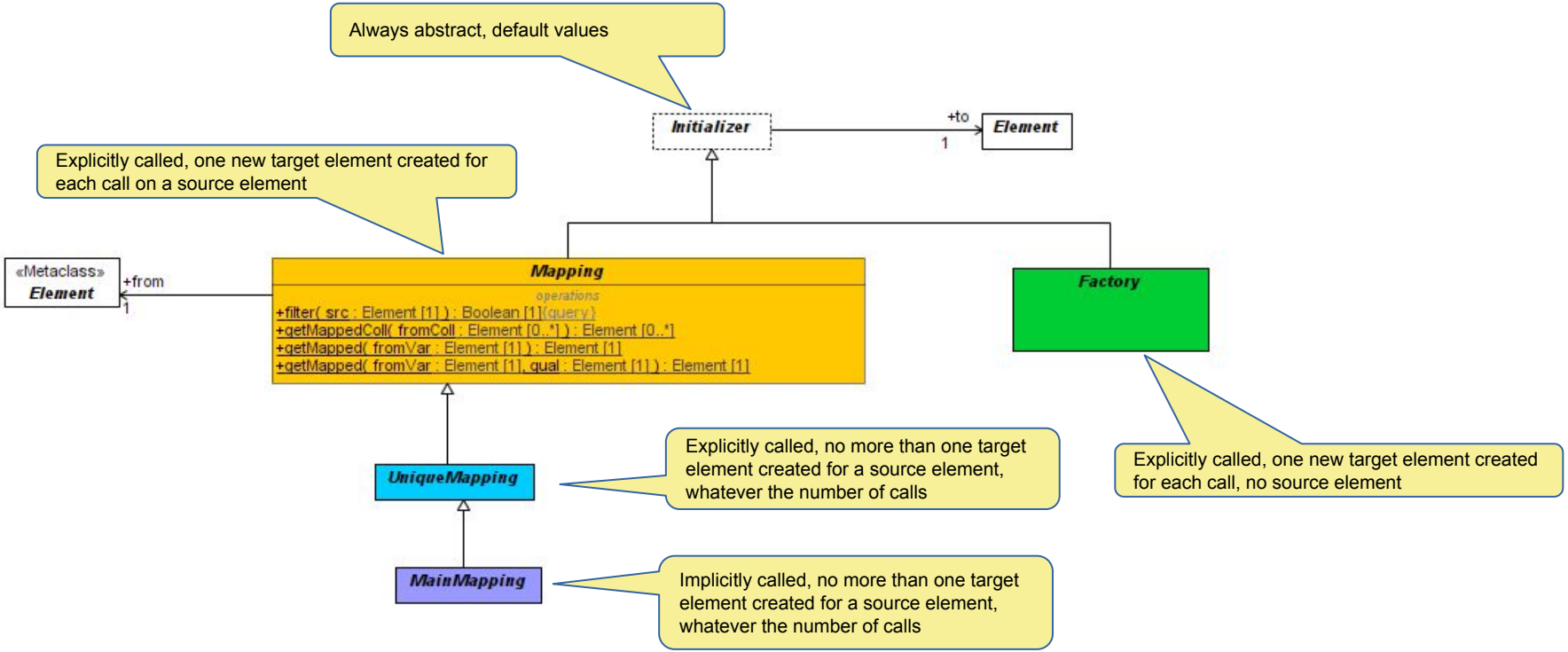
OBJECT MANAGEMENT GROUP®

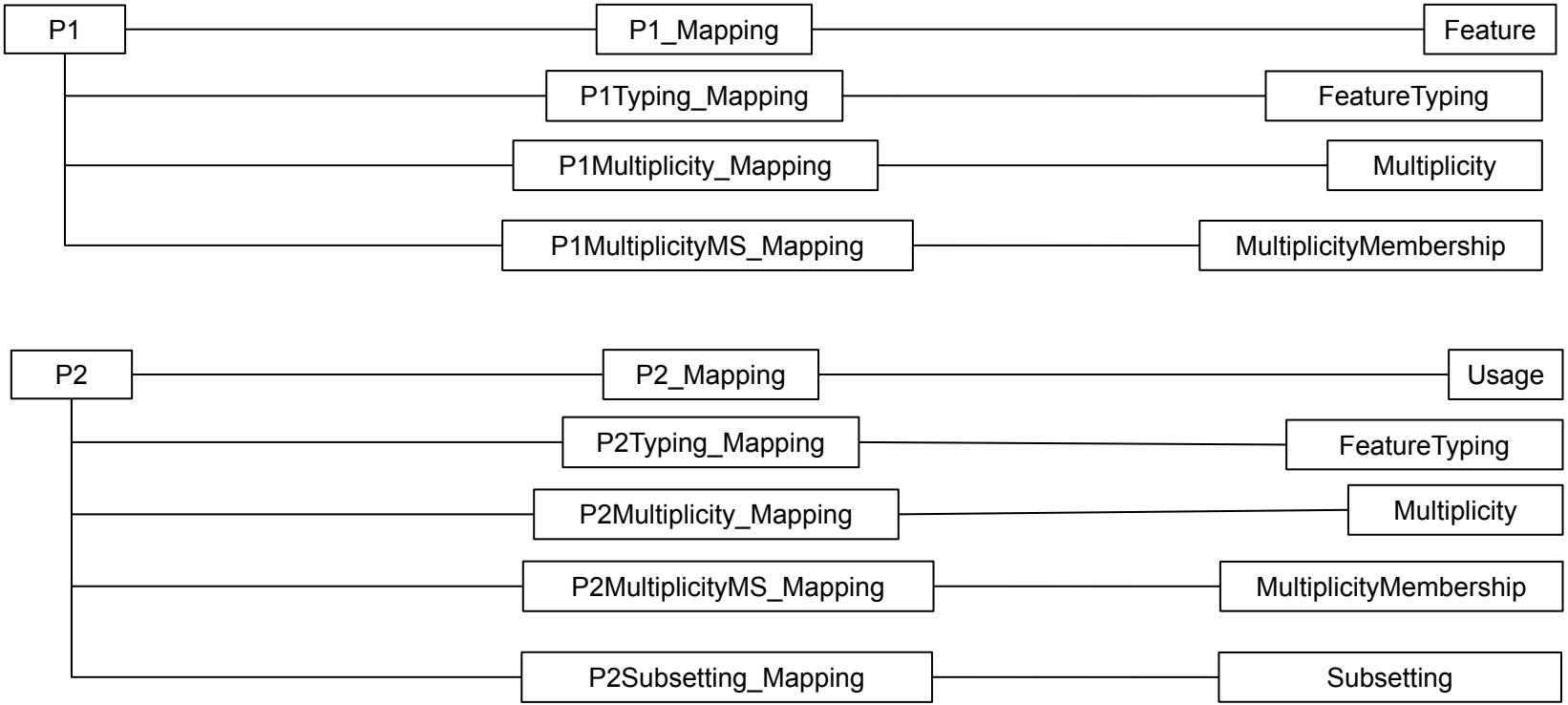
Transformation Model Principle (Reminder)



Transformation Model Foundations (Reminder)



How we made the model grown up...



Situation at Q1 2025

Kind of transformation classes	Count
Initializers	78
Mappings	783
Factories	43
Total	**904**

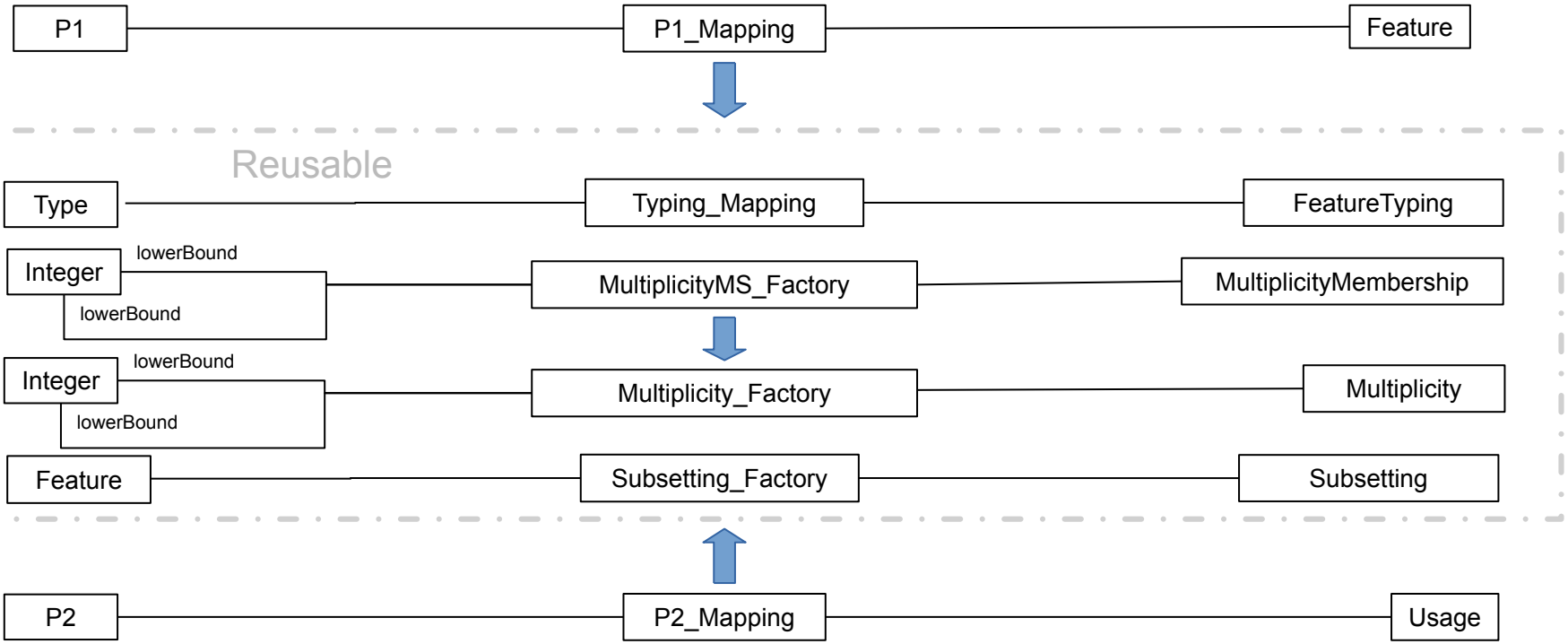
- Double constraint on the transformation model:
  - Shall not constraint a specific implementation
  - Shall be compatible with the code generator of the pilot implementation

- No clear specification on top of the model
- Overview tables generated from the model but the algorithm is inefficient
- No clear/formal validation of the transformation results
- Transformation model maintenance and evolutions are difficult and very time consuming, while we are missing resources

Refactoring approach

- Makes the overview tables “manually” specified
- Use them as the high level specification of the transformation
- Revise the mappings specification trying to get benefits from:
  - The specialization of the foundational mapping classes semantics
  - The improvement of the code generator
  - A global review of them

How we make the model shrink down...



Current Status

Kind of transformation classes	Count
Initializers	78
Mappings	229
Factories	33
Total	**340**

- 60% size reduction
- Our MIWG test suite executes successfully
- May increase a bit while the validation will progress

- Based on the overview table specifications
- Still “generic” and generable as a pilot implementation
- Avoid duplications as much as possible, maximize reuse
- The OCL code (operations’ body conditions) is simpler, more compact and more readable

Next Steps

- Pursue the validation of the refactored version
  - Complete the high level specifications (overview tables)
  - Additional test suites: UML4SYSML & SysML
- Getting the refactored version approved by the RTF (i.e. issue → resolution → vote)
- Make it our official version (replacing the one in the trunk)
- Check all (transformation) open issues against this new version in order to close all obsolete ones
- Resume the regular RTF works on the new version (including transformation result validation)

Thank you!