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Context-dependent information space for construction information processes

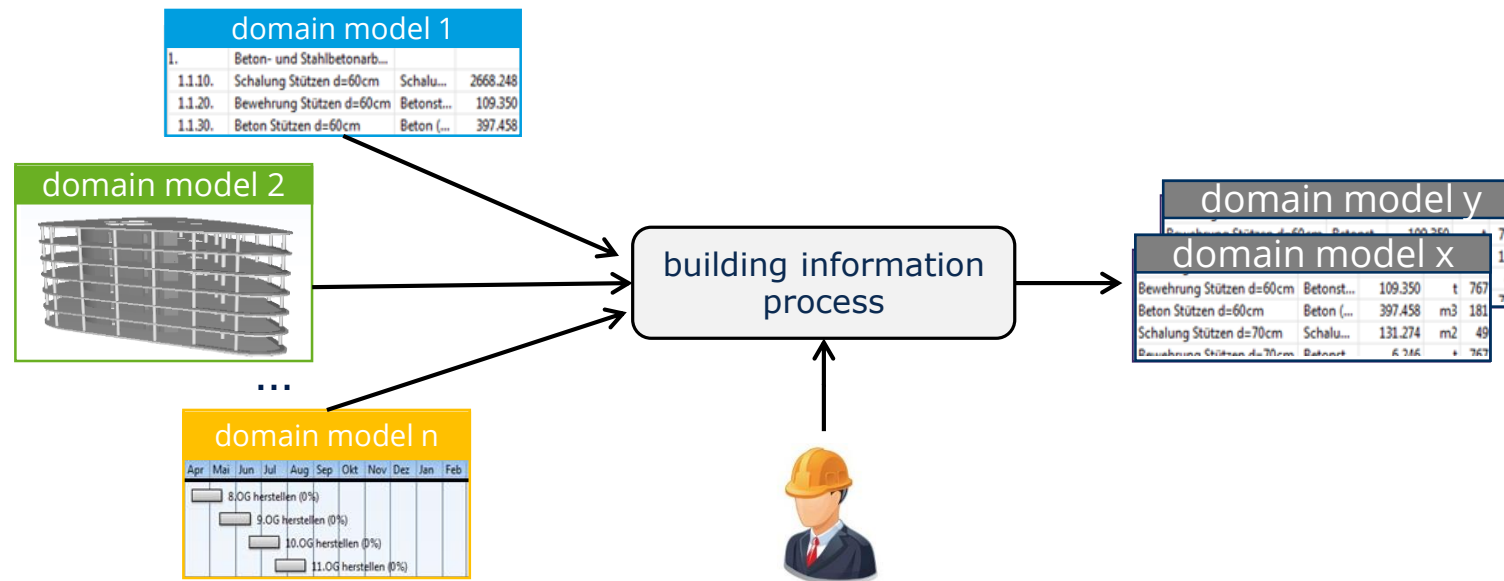
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SBE19 Graz



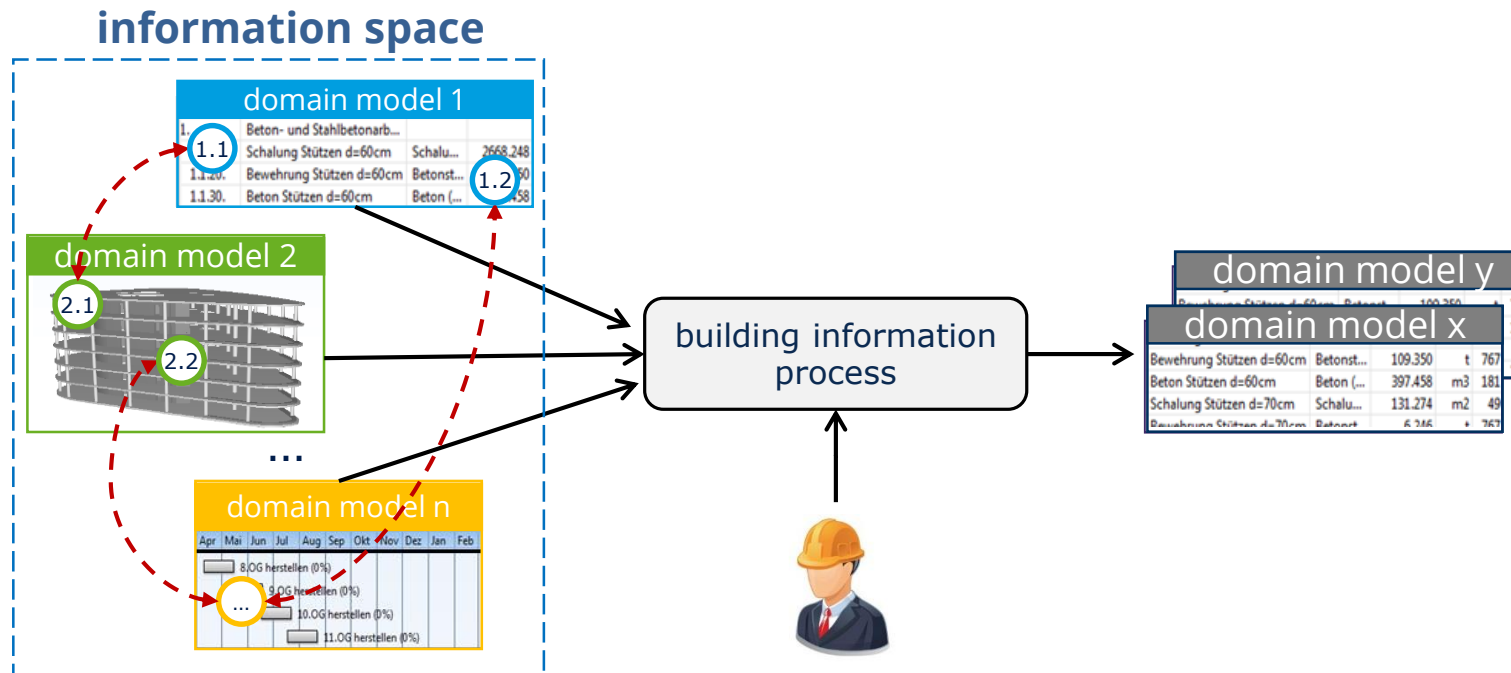
Collaborative Building Information Processes

- many actors
- various specialized applications
- different domain information models
- information exchange: cross-model, cross-format, cross-domain and cross-organizational



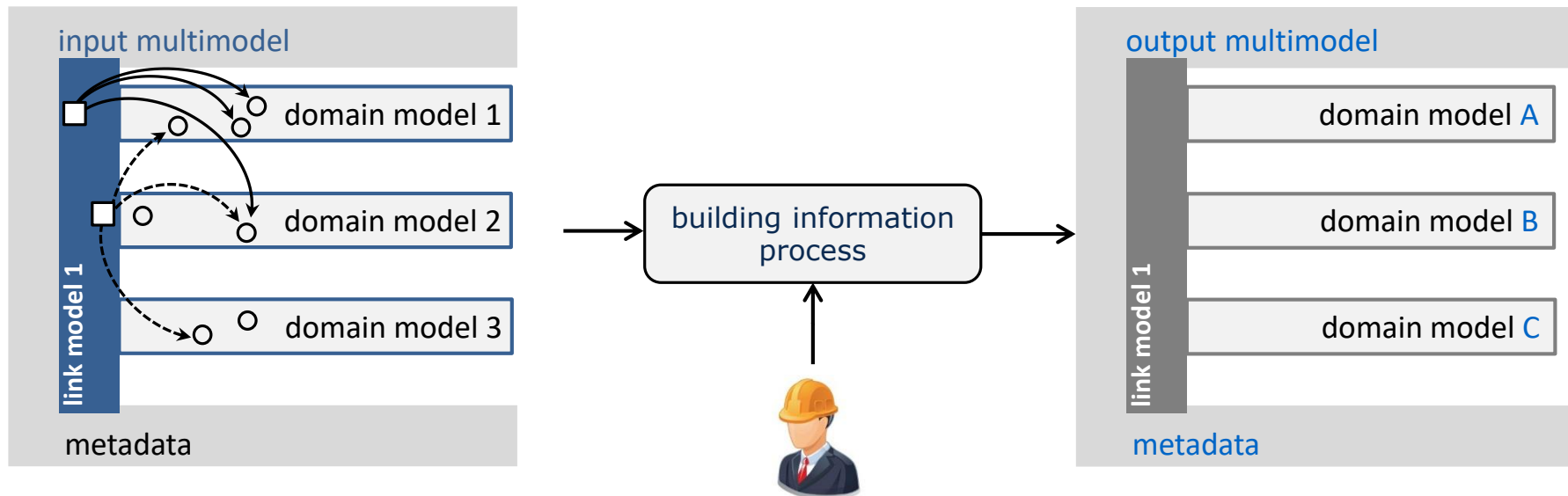
Information Space

- various functional and organizational information must be processed together → **interdependencies**



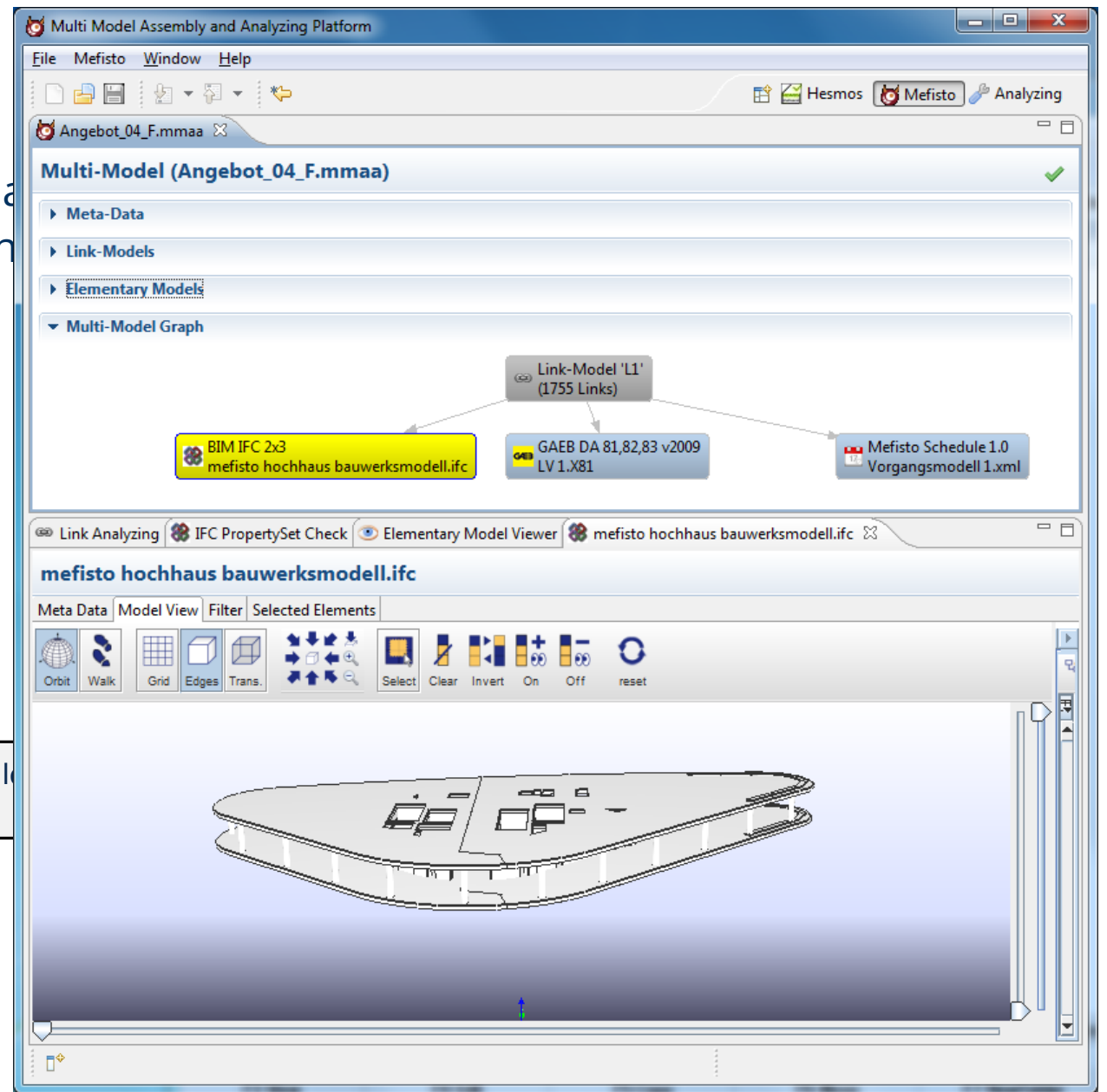
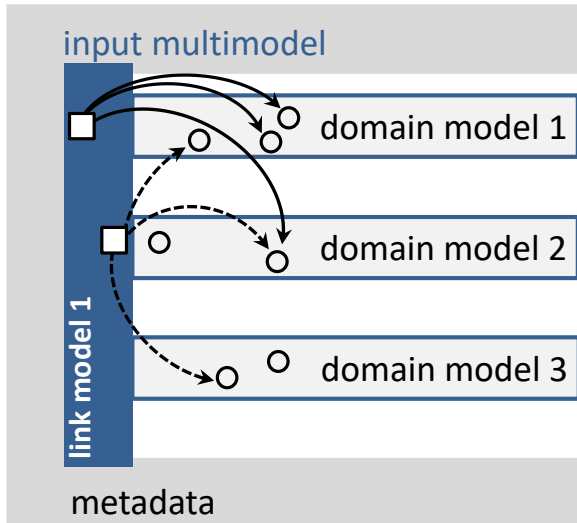
Generic Multimodel

- published as MMC 2.0 container by BuildingSmart
- standardized by DINSPEC 91350 for BIM- LV containers (IFC + GAEB)



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Problem: Multimodel Size

increasing **size** and **amount** of information models:

- more complex production processes and buildings
- new requirements (energy efficiency / sustainability / life cycle considerations)
- increasing quality and granularity
- increasing number of involved actors and domains

→ multimodels become very large

complicates the handling and acceptance:

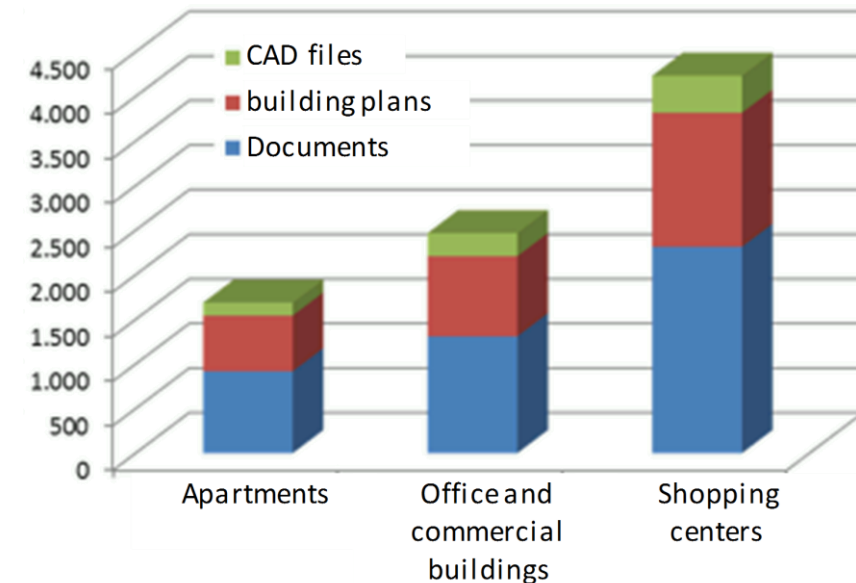
- orientation and localization of required detail information
- tracing of model dependencies
- hardly to estimate which subset is relevant
- mobile usability
- security issues

→ Missing, misinterpreted or incorrect information often causes **quality defects, delays** or **cost overruns**

Objectives:

- limit the quantity, scope and complexity of the information exchanged
- by **needs-based information supply**

turnkey construction

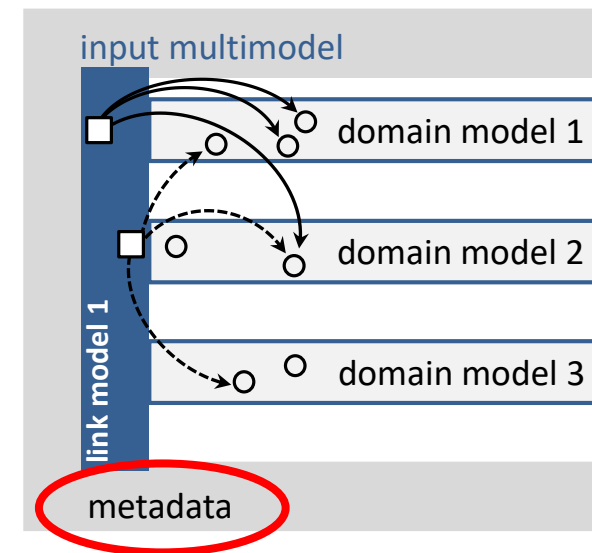
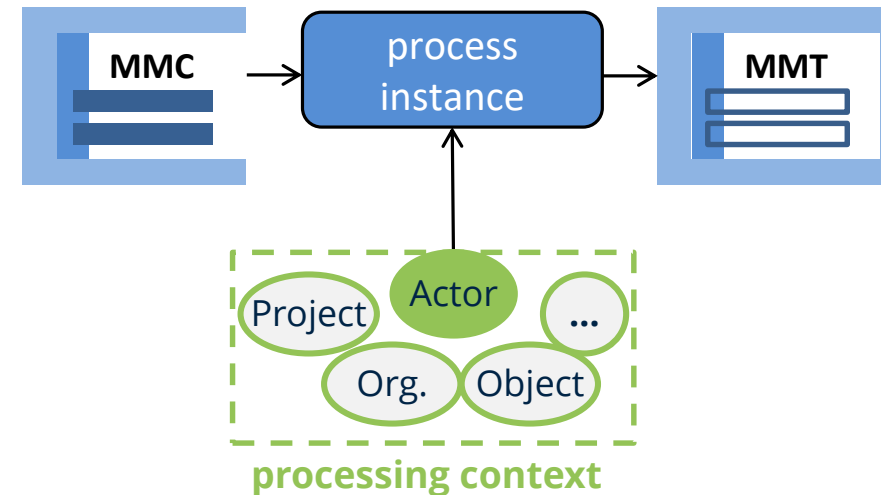


Context dependency of Multimodels

- Information processes are embedded in a task context
- task context determines the information requirements:
 - specific model sections,
 - model qualities
 - model interrelationships
 - certain building parts,
 - corresponding properties
 - allocation units or individual dates and time windows

- different aspects of the processing context determine the **precisely fitting information spaces**

→ context dependency of information requirements



Context information for construction information processes

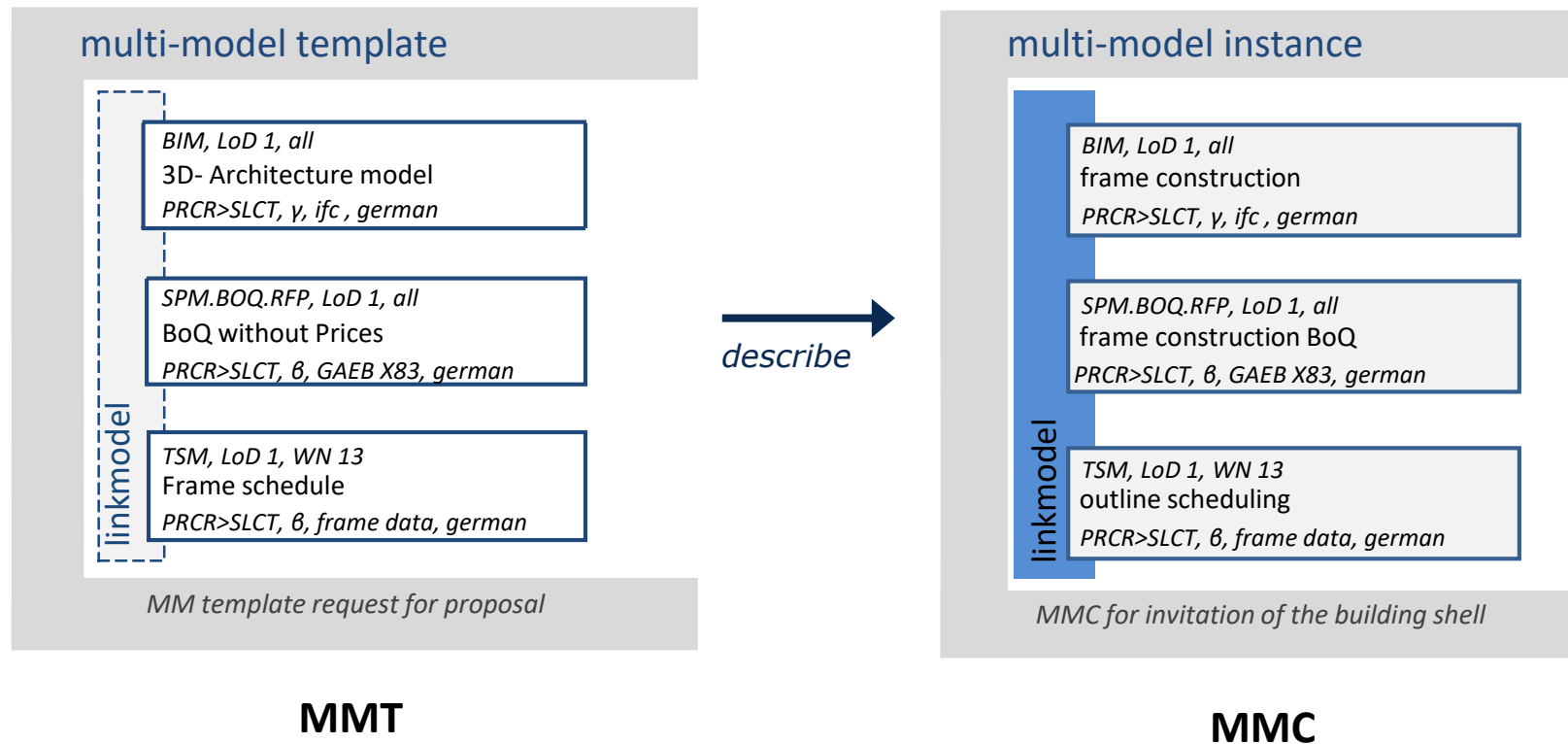
- processing context: **main elements** (process, actor and resource) and **associated sub-aspects**.
- context aspects differ in influence on the information requirements



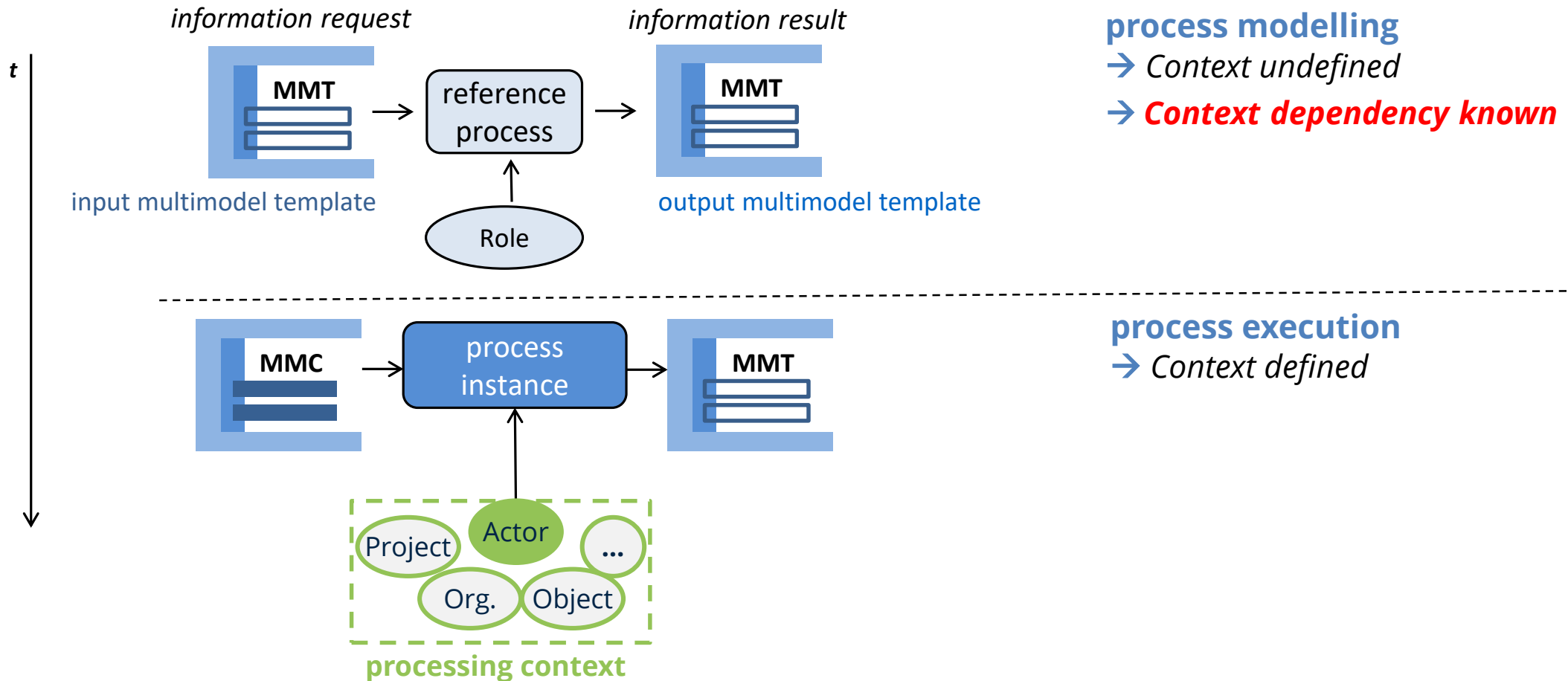
process, actor and resource.

Multimodel templates

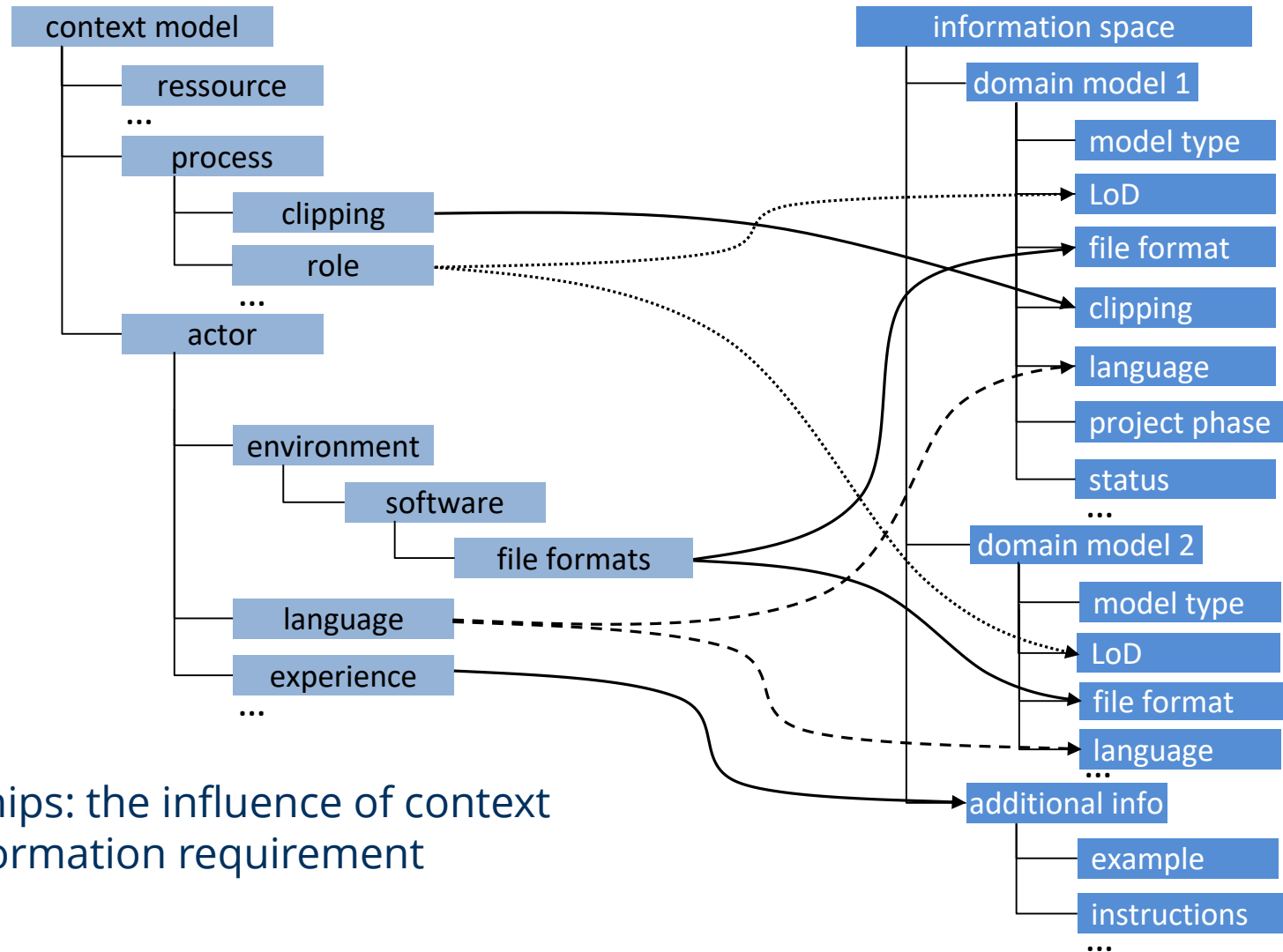
- Metadata can describe Multimodels both **prescriptively** as well as **descriptively**



reference process

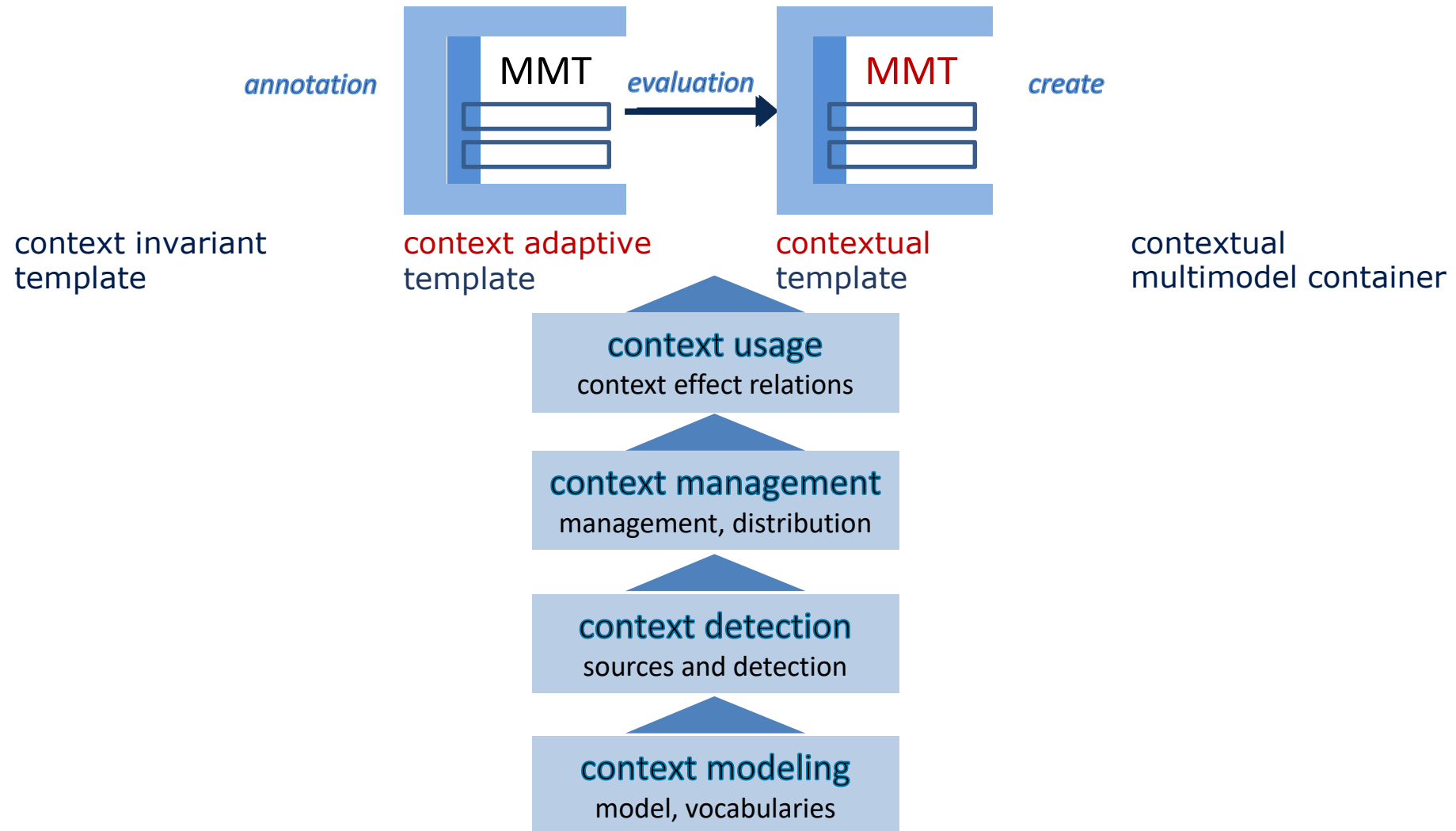


Context Effect Relations

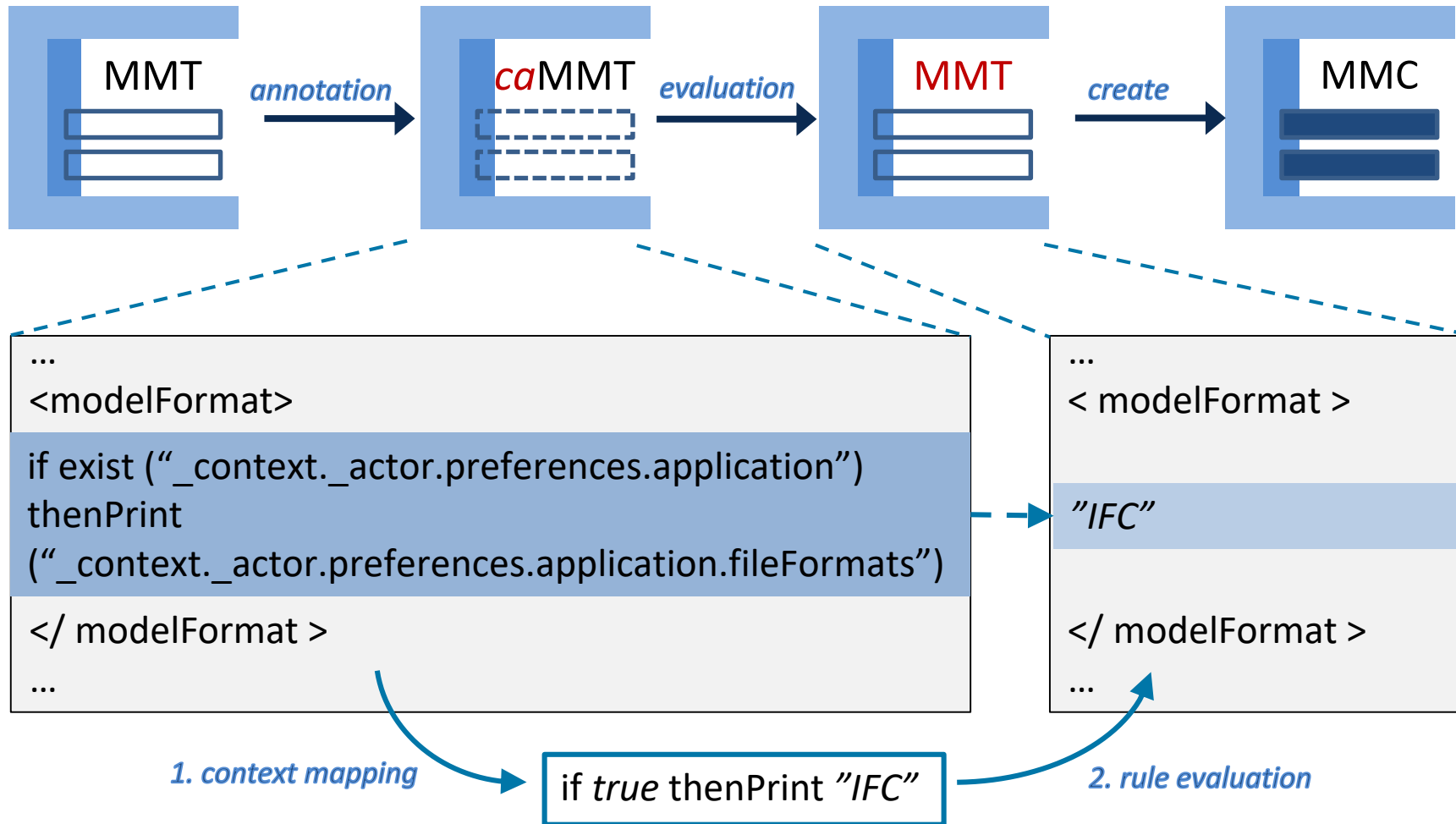


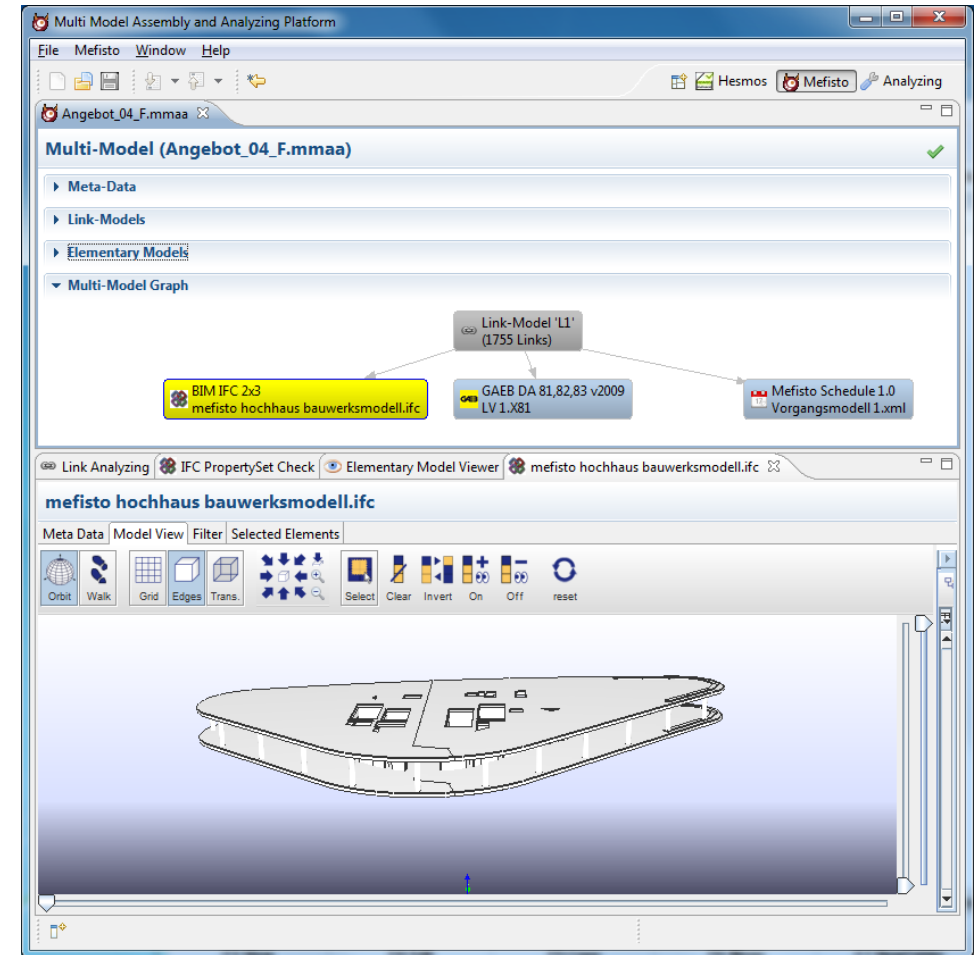
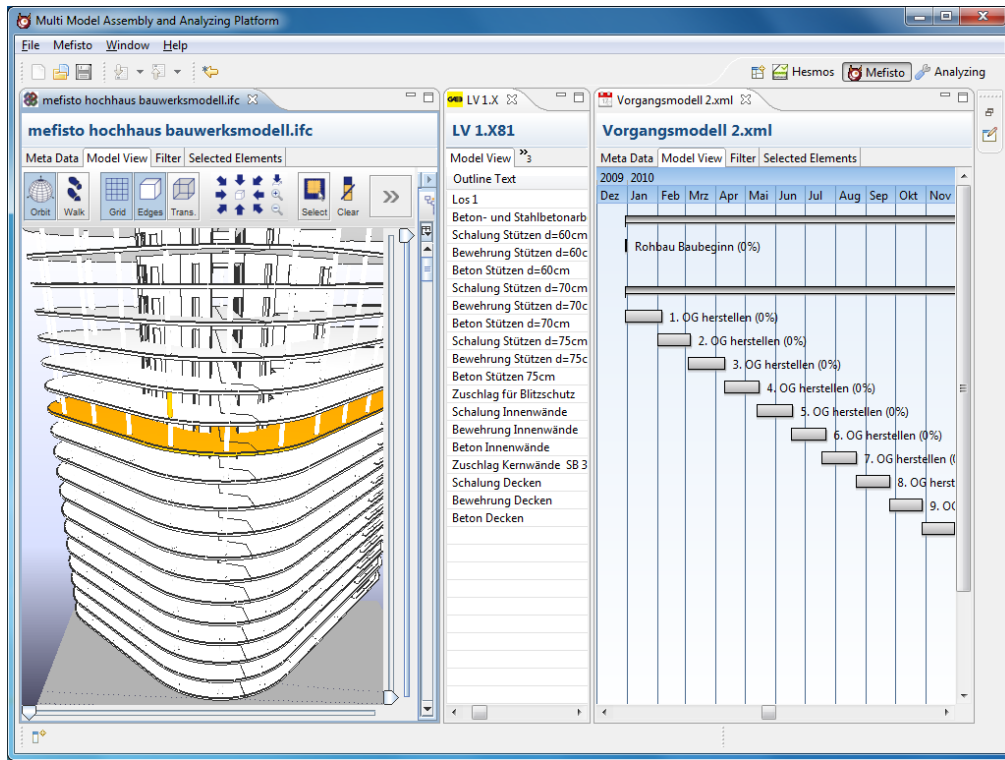
contextual relationships: the influence of context attributes on the information requirement

Approach of a Contextual Information Supply: context integration



Rule Evaluation





	context invariant multimodel	context-specific multimodel
BIM building model (bauwerksmodell.ifc)	19,182 kB	1,556 kB
SPM specification models (GAEB LV1.X81)	606 kB	545,145 kB
TSM time schedule model (vorgangmodell1.xml)	190,322 kB	171,210 kB
link modell	2964 Links	1755 Links

Conclusions

- information spaces leads to an increased information potential
- expected further increase in the size and complexity of construction information spaces
- For usability, it is important to reduce the size and complexity of information spaces.
- ensure that the information processes are provided with information that is appropriate to the current situation

presented approach:

- Basis for the generation of precisely fitting information spaces through the formalization of context effect relations
- mapping between contextual factors and affected information space parameters through ContextScript rules in Multimodel templates
- By evaluating them using current context information, a context-specific information space can be precisely described and afterwards generated.
- So we get the possibility to generate context-aware information logistics for Construction information processes

necessary prerequisites:

- functioning context infrastructure (context sources, context logistics)
- Adaptation methods for specific domain information models

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Thank You for Your Attention

Please send your further questions and comments to

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