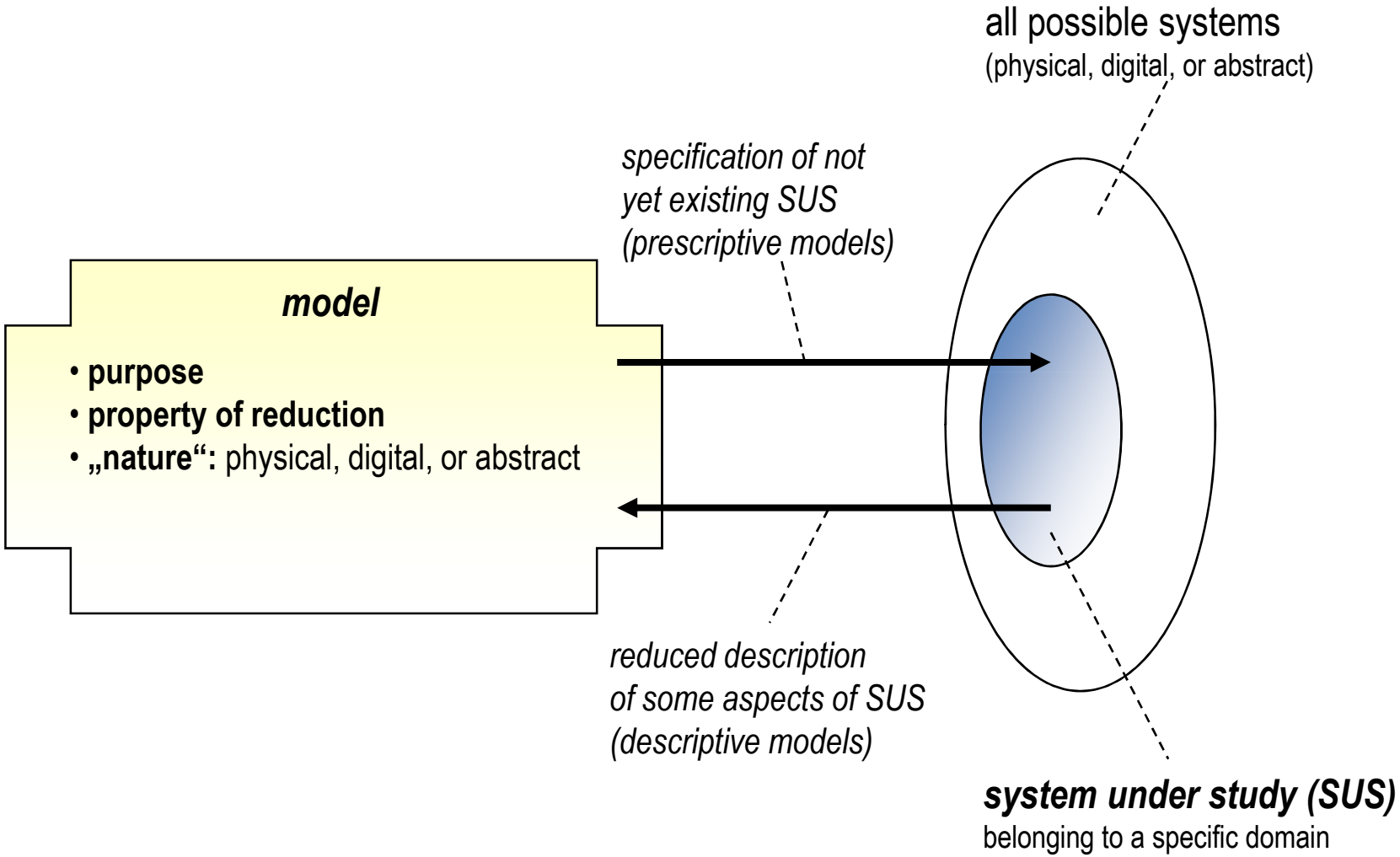
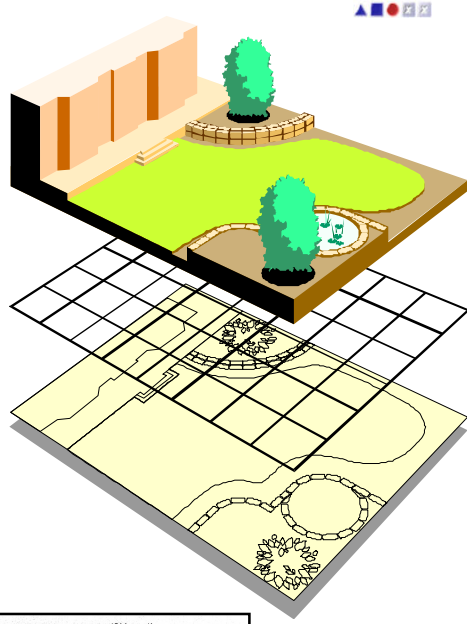
TUTORIAL
INTRODUCTION AND OVERVIEW

1. DEFINITION OF SYSTEM UNDER STUDY



2. TYPE OF APPLICATION SCENARIO



- Representation Characteristic

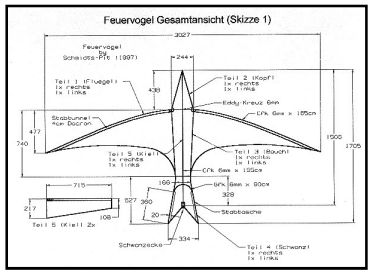
  "Models as a representation of natural or artifical originals, that again can be models." [translated]

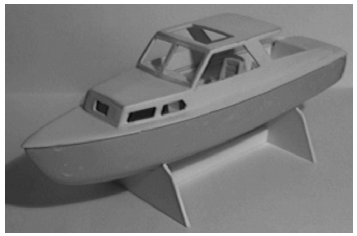
- Abstraction Characteristic

  "Models in general do not capture all attributes of the represented original, but only those that seem relevant to the modeller or model user." [translated]

- Pragmatic Characteristic

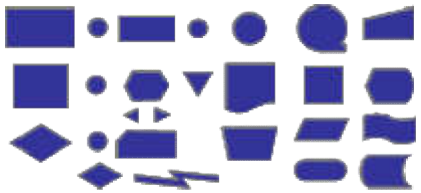
  Models meet their substituion function for specific subjects, within a pre-determined time intercal and with limitations on defined intellectual and/or real operations. [translated]



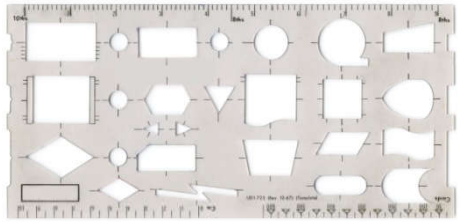


Reference: Herbert Stachowiak: Allgemeine Modelltheorie. Wien 1973.

3. INTRODUCTION OF TERMS



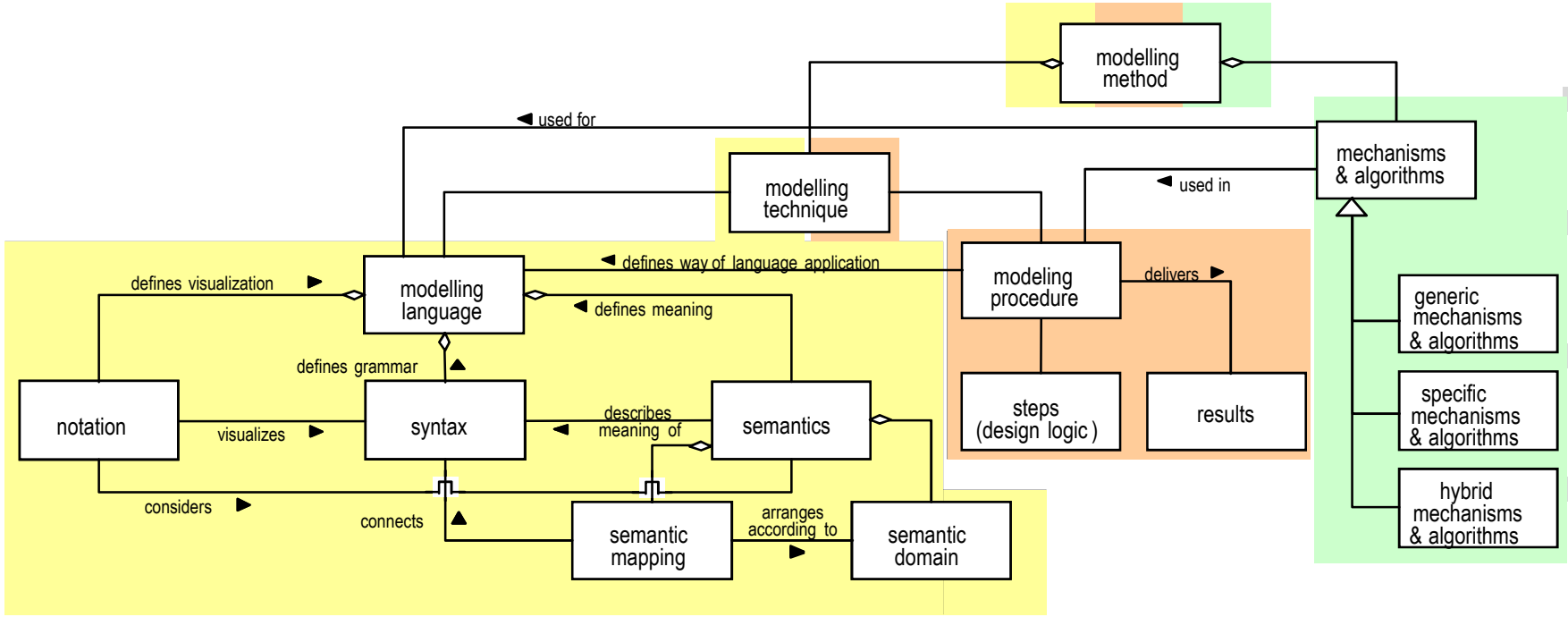
- **Modelling Language:**
  Modelling constructs (object types) and their relations (relation types) to each other to declare a model.
- **Metamodel:**
  The model of the syntax of the modelling language
- **Meta^2 Model:**
  Model of abstract syntax of a language to describe meta models.
- **Modelling Technique:**
  A modelling language and proceeding instructions for creation of a model in this modelling language.
- **Mechanisms und Algorithms:**
  Provision of functionalities to process models such as manipulation, visualisation, query, transformation or simulation depending on the modelling language and modelling procedure.



Pictures [SXC] 4

“Requirement Analysis needs a framework and a procedure to identify requirements for modelling methods in a systematic and transparent way.”

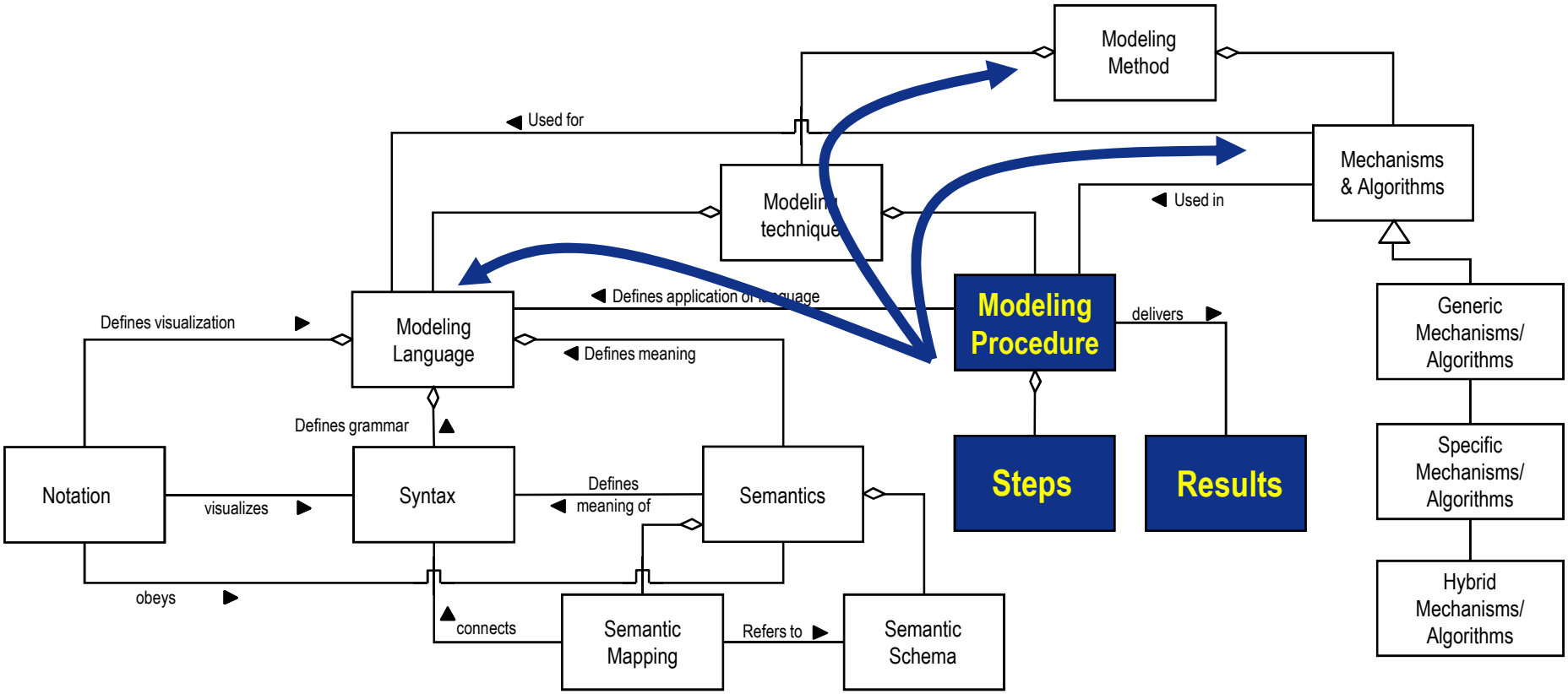
GENERIC MODELLING METHOD FRAMEWORK



Reference: Karagiannis, D., Kühn, H.: „Metamodelling Platforms“. In Bauknecht, K., Min Tjoa, A., Quirchmayer, G. (Eds.): Proceedings of the Third International Conference EC-Web 2002 – Dexa 2002, Aix-en-Provence, France, September 2002, LNCS 2455, Springer, Berlin/Heidelberg, p. 182 ff.

MODELLING PROCEDURE AS STARTING POINT

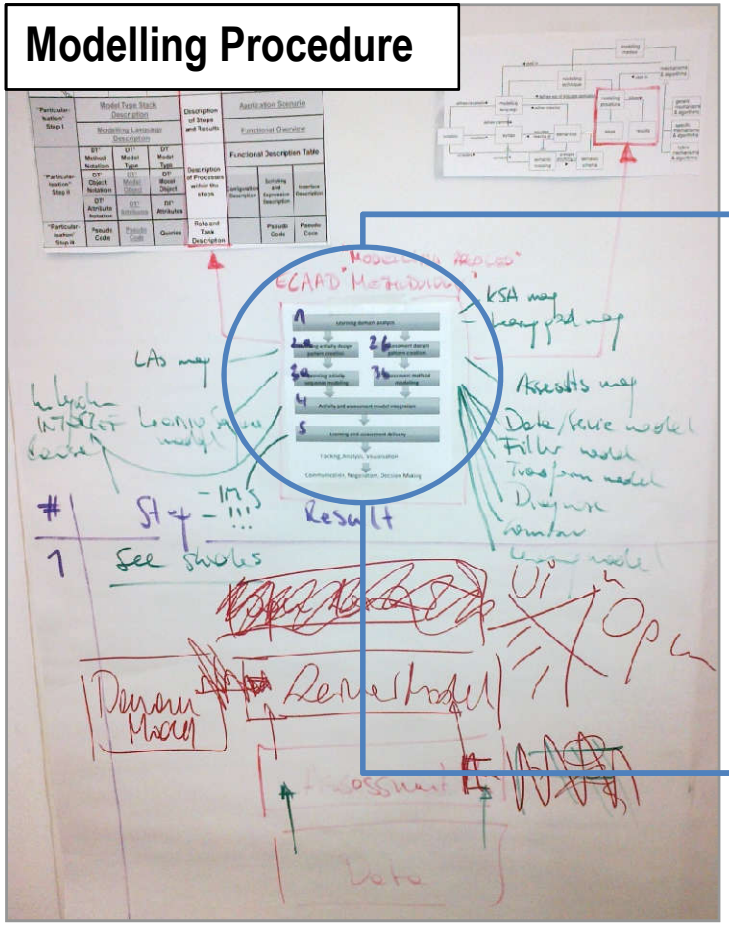
How to support modelling procedure in an optimal way?



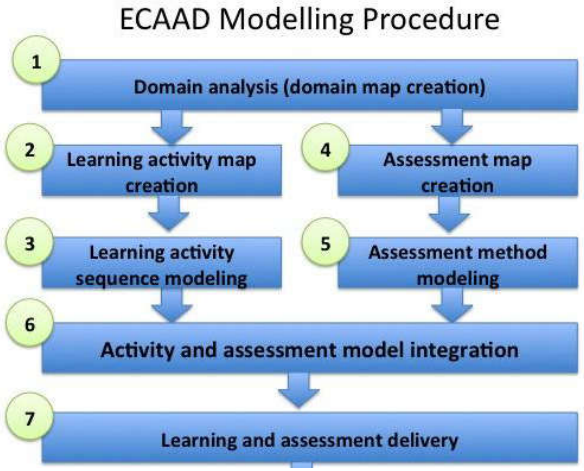
MODELLING PROCEDURE AS STARTING POINT

Example: ECAAD (Evidence-Centered Activity and Assessment Design) from eLearning Domain

Modelling Procedure



Overview of Modelling Langauge

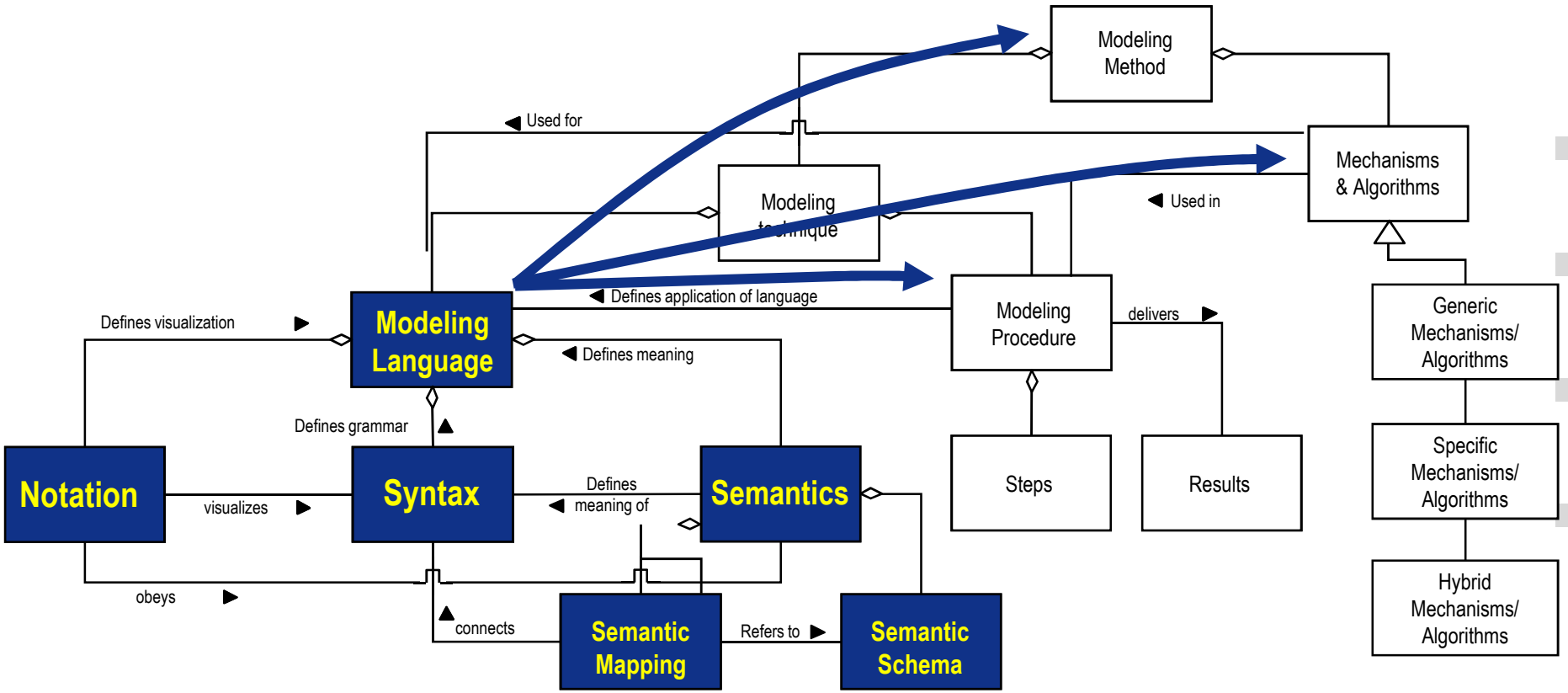


Overview of Mechanisms & Algorithms

- Assessments, Tracking, Visualisation
- Transformation, Integration of Data
- Diagnose, Communication, Negotiation
- Export into student learning system

MODELLING LANGUAGE AS STARTING POINT

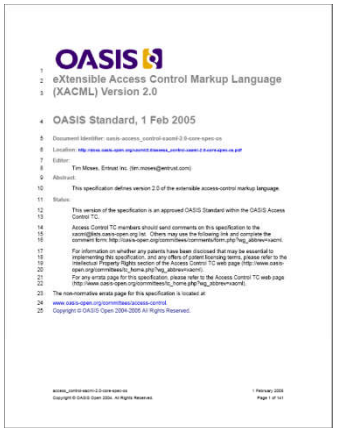
What concepts are required and how do they behave?



MODELLING PROCEDURE AS STARTING POINT

Example: MoSeS4eGov (Model-based Security System for eGovernment) from eGovernment domain

XACML as Conceptual Basis

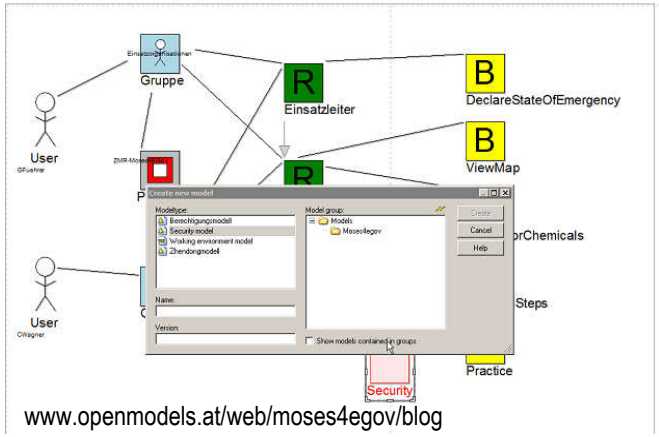

OASIS

eXtensible Access Control Markup Language (XACML) Version 2.0

OASIS Standard, 1 Feb 2005

docs.oasis-open.org/xacml/2.0/access_control-xacml-2.0-core-spec-os.pdf

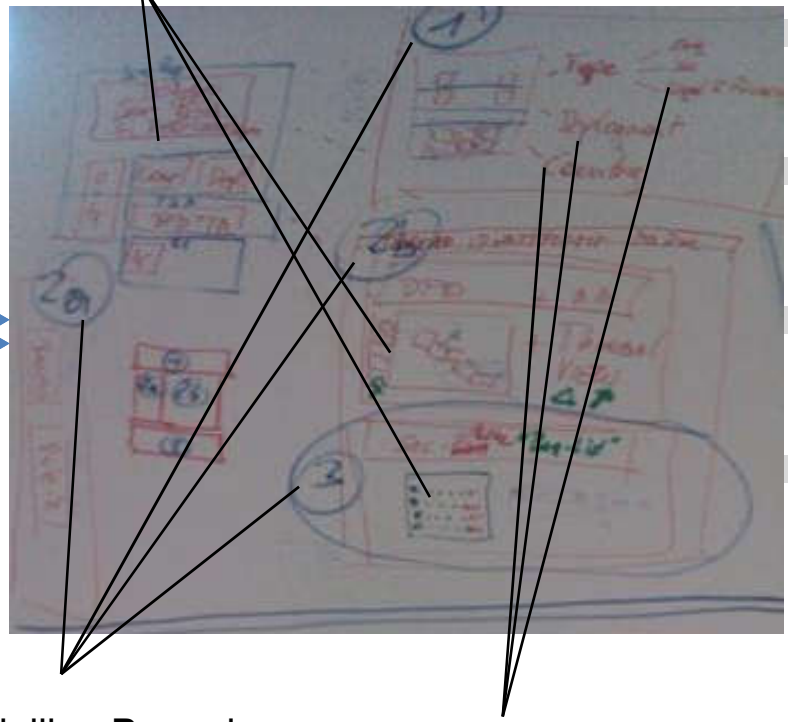
Implementation of „SECTINO“



www.openmodels.at/web/moses4egov/blog

Modelling Method Overview

Modelling Langauge

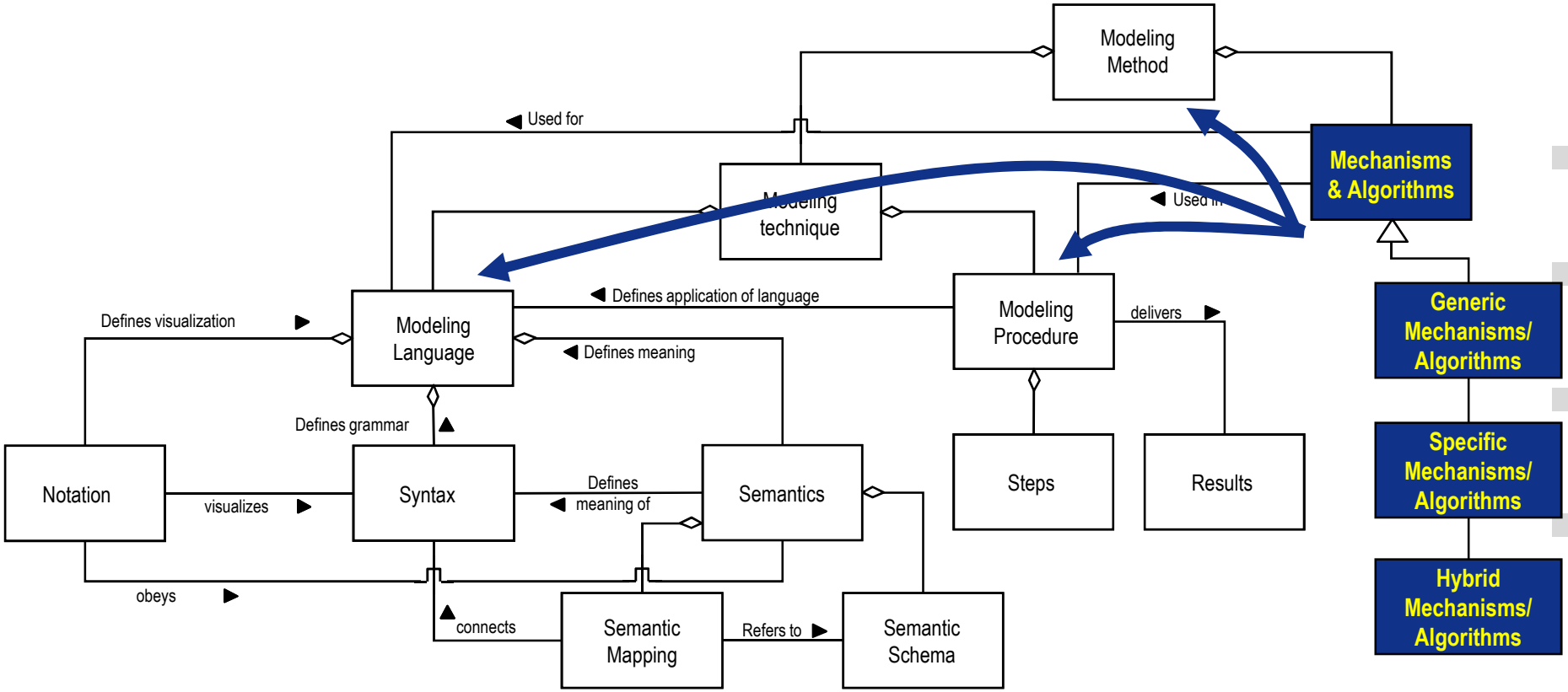


Modelling Procedure

Mechanisms & Algorithms

MECHANISMS & ALGORITHMS AS STARTING POINT

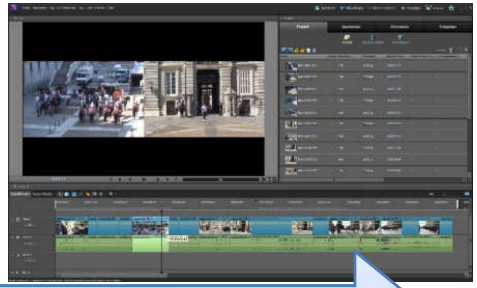
Which functionality is required and how are models expected to be used.



FROM BOOK TO MOVIE: A METAPHOR

Screen Play

- Dialogs
- Interactions
- Scenery
- Effects
- …



Writing → **Shooting** → **Cutting**

WHAT IS THE ANALOGUE FOR MODELLING METHODS ?

Conceptualisation → **Implementation** → **Deployment and Tooling**

CONCEPTUALISATION PHASE

Modeling Method

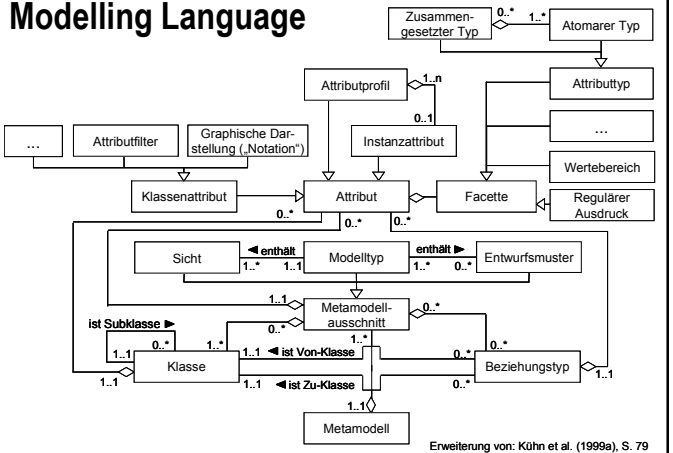
Modeling technique

Modeling Language

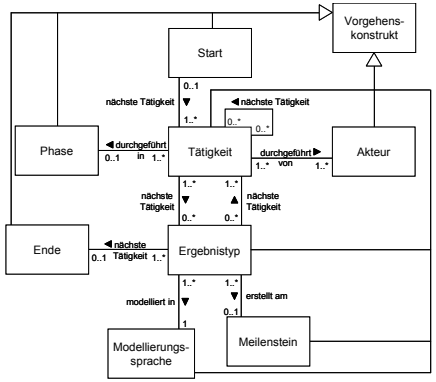
Modeling Procedure

Mechanisms & Algorithms

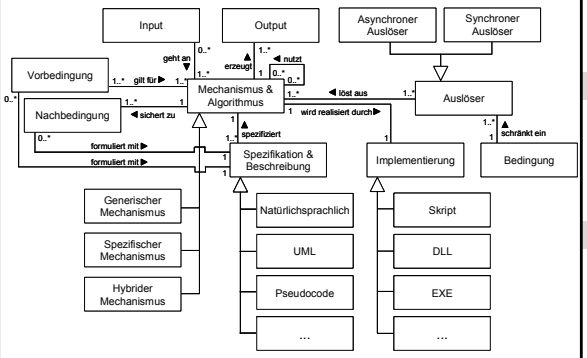
Meta Model: Modelling Language



Meta Model: Modelling Procedure



Meta Model: Mechanisms & Algorithms



Instantiate

Instantiate

Instantiate

MM-Instance of Modelling Language Meta Model

MM-Instance of Modelling Procedure Meta Model

MM-Instance of Mechanisms & Algorithms Meta Model

Modelling Method

MM … Modelling Method

Reference: Kühn, H. (2004). Methodenintegration im Business Engineering. PhD Thesis, University of Vienna

IMPLEMENTATION PHASE

Modeling Method

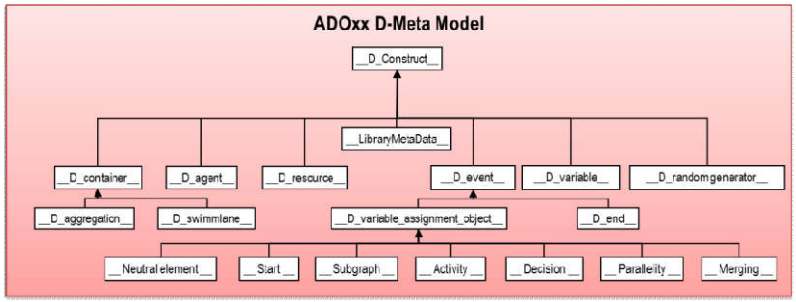
Modeling technique

Modeling Language

Modeling Procedure

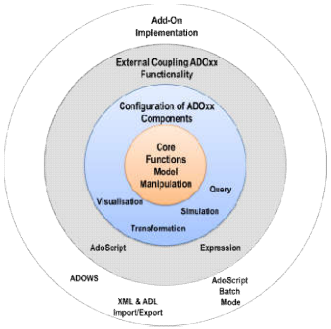
Mechanisms & Algorithms

ADOxx® Meta Model



Implicit ADOxx® support

ADOxx® Mechanisms & Algorithms



Inheritance

Configuration & Scripting

MM-Specific Inheritance of ADOxx® Meta Model

Indirect support of procedure

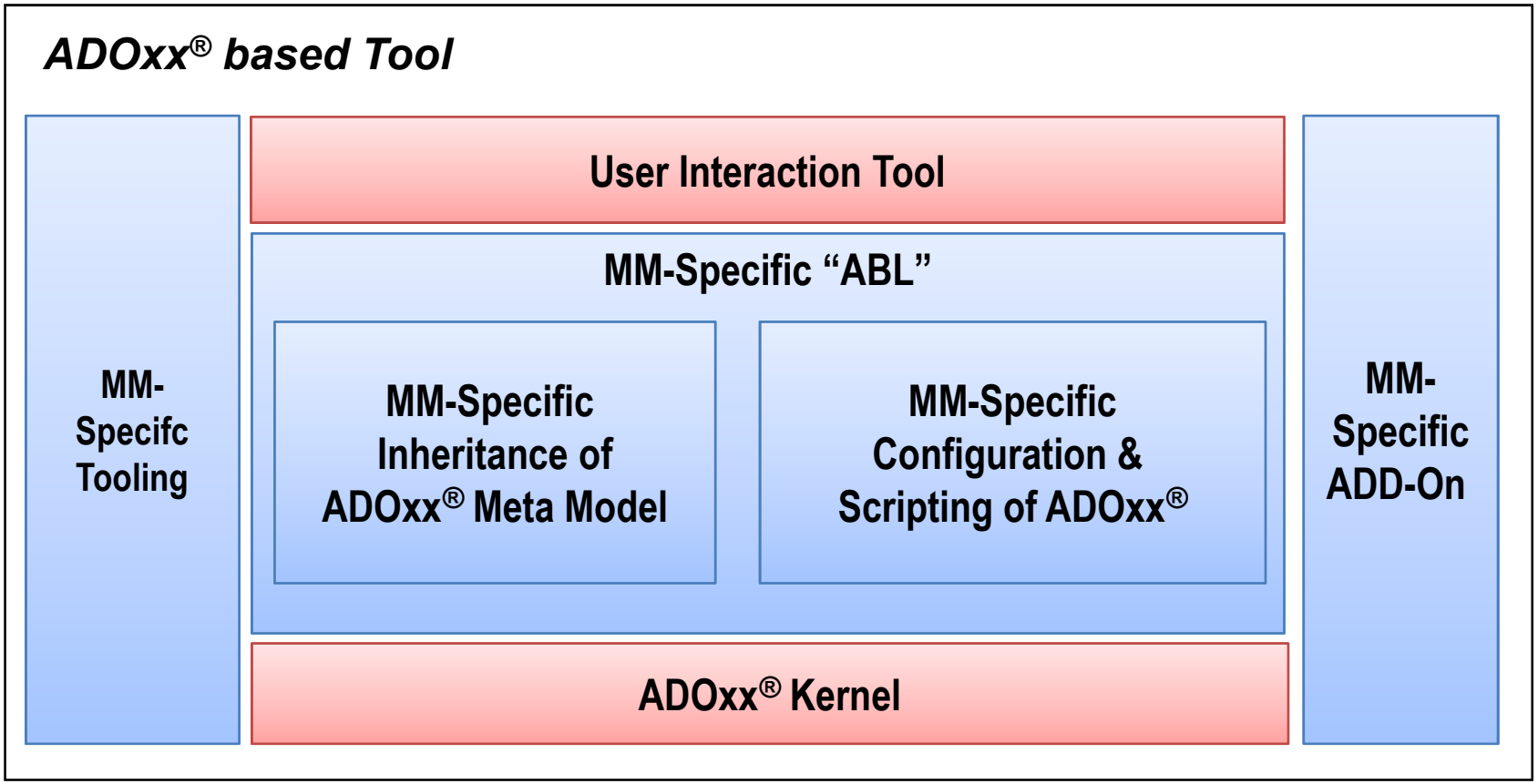
MM-Specific Configuration & Scripting of ADOxx® + Add-Ons

Modelling Method Implementation based on ADOxx®

MM … Modelling Method

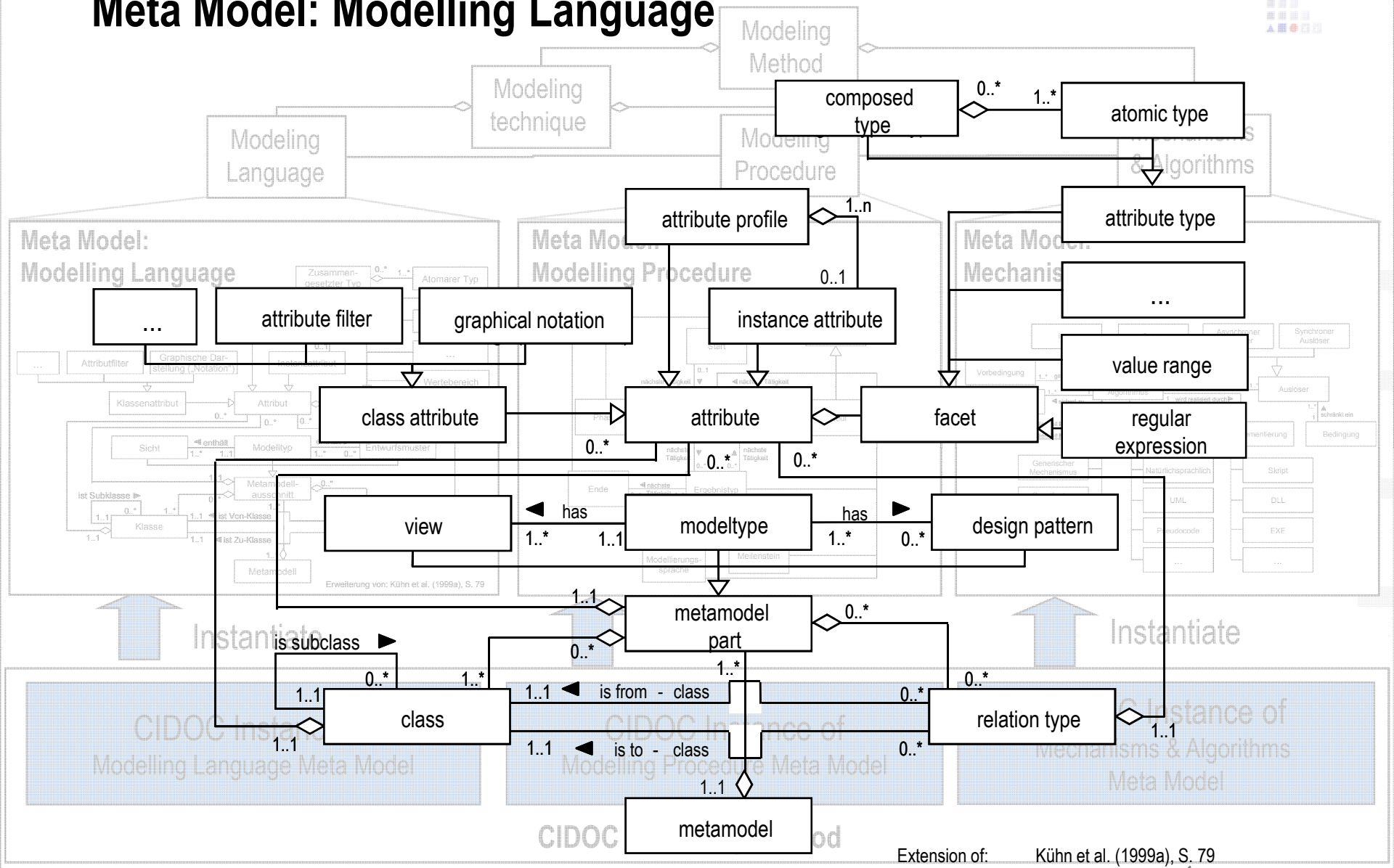
Reference: Kühn, H. (2004). Methodenintegration im Business Engineering. PhD Thesis, University of Vienna

DEPLOYMENT AND TOOLING PHASE



MM … Modelling Method

Meta Model: Modelling Language

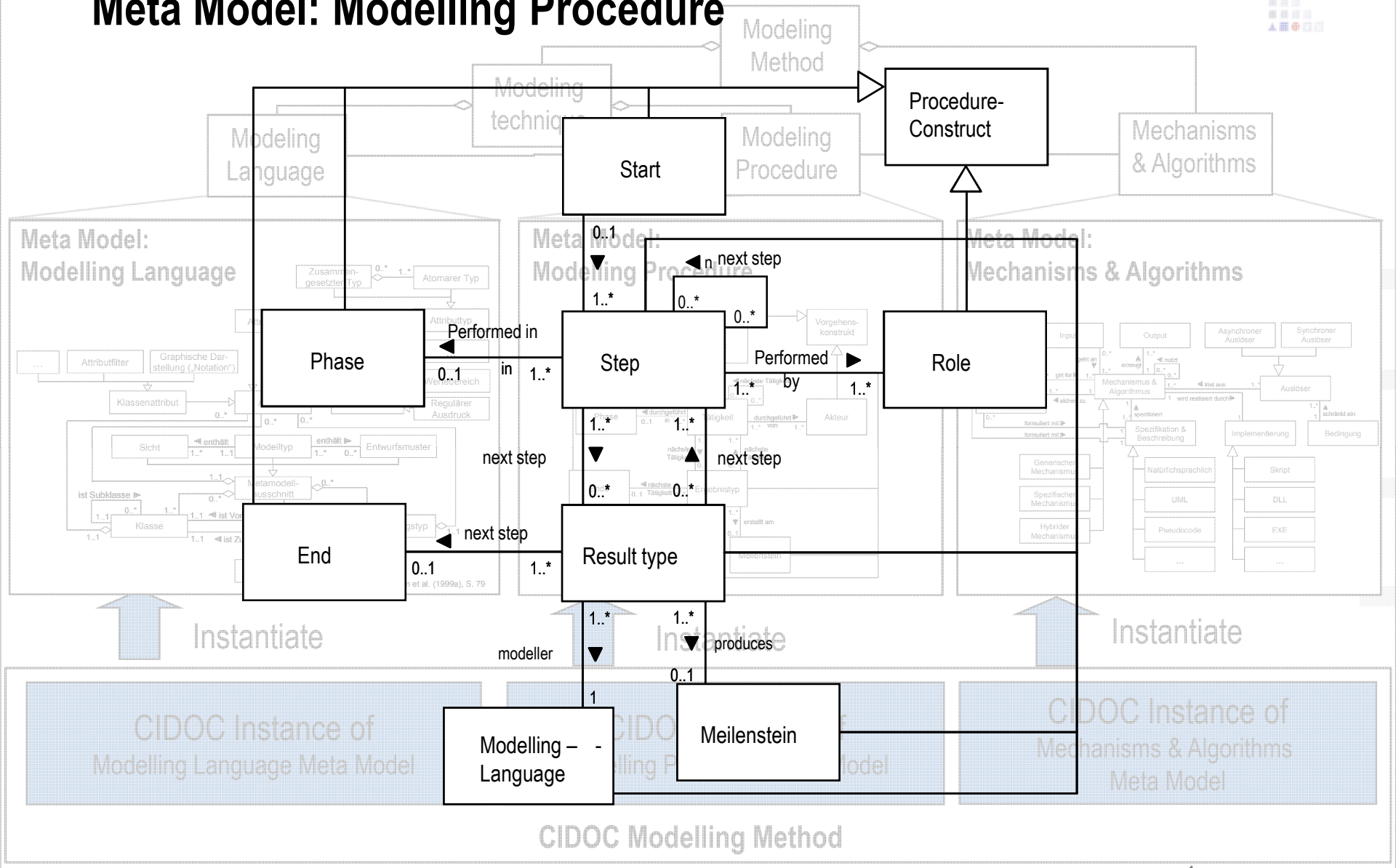


Extension of: Kühn et al. (1999a), S. 79

BACK

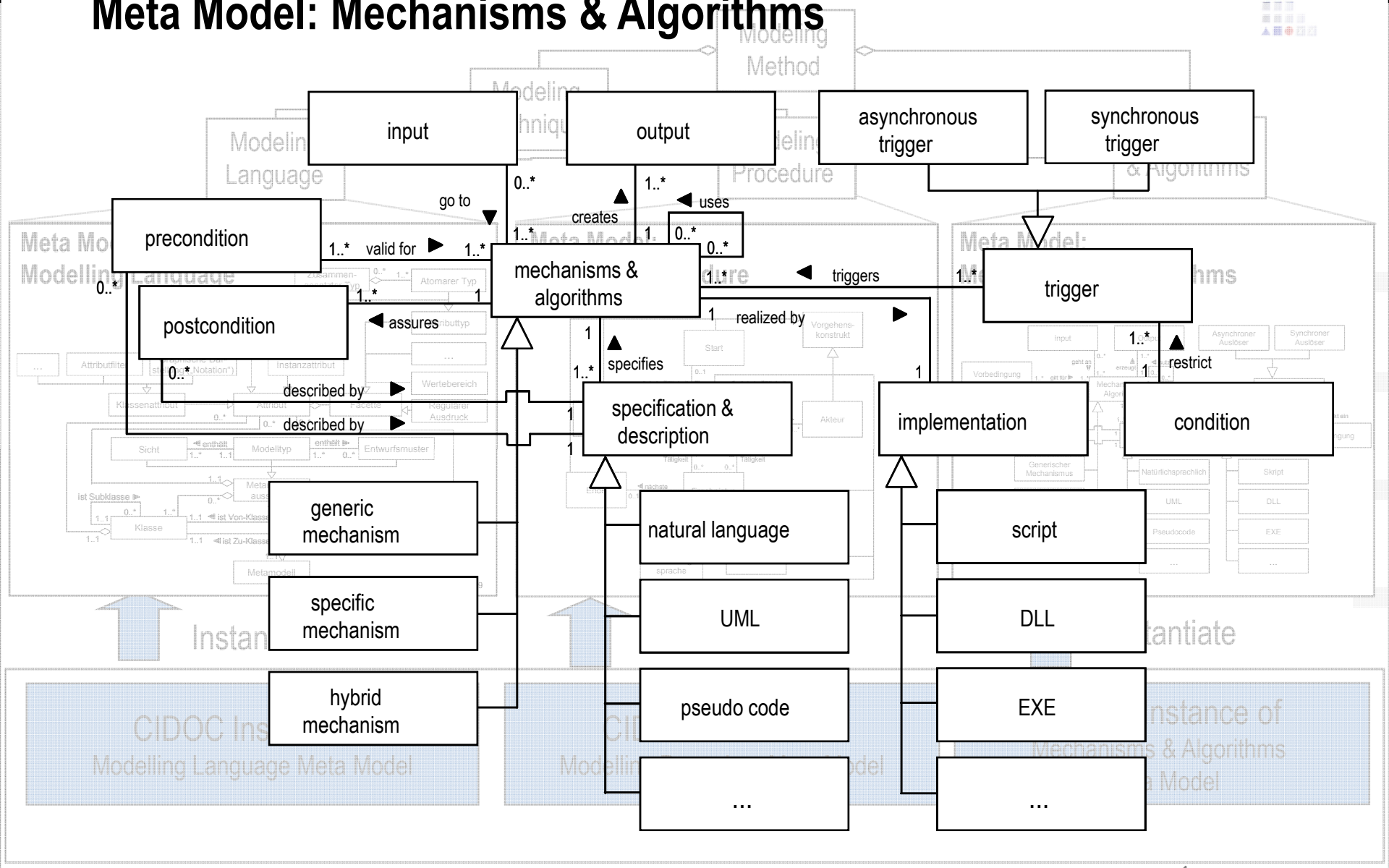
Reference: Kühn, H. (2004). Methodenintegration im Business Engineering. PhD Thesis, University of Vienna

Meta Model: Modelling Procedure



Reference: Kühn, H. (2004). Methodenintegration im Business Engineering. PhD Thesis, University of Vienna

Meta Model: Mechanisms & Algorithms



Reference: Kühn, H. (2004). Methodenintegration im Business Engineering. PhD Thesis, University of Vienna

We thank you for your attention!

Any Questions?