AGILE MODELLING METHOD ENGINEERING WITHIN OMiLAB®

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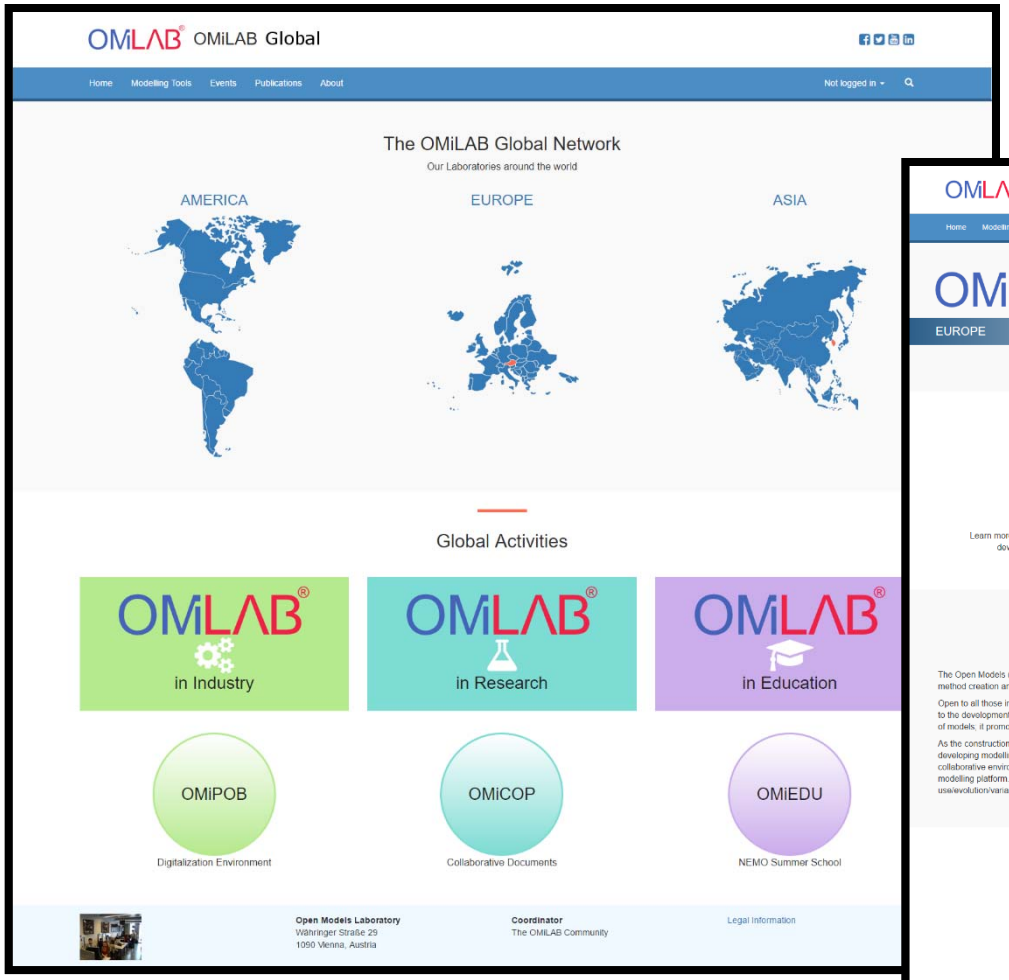
RCIS Conference, Brighton, May 12th 2017

THE OMLAB®.org COMMUNITY

INTRODUCTION TO OMLAB®

https://youtu.be/V5jtD_2-U2k

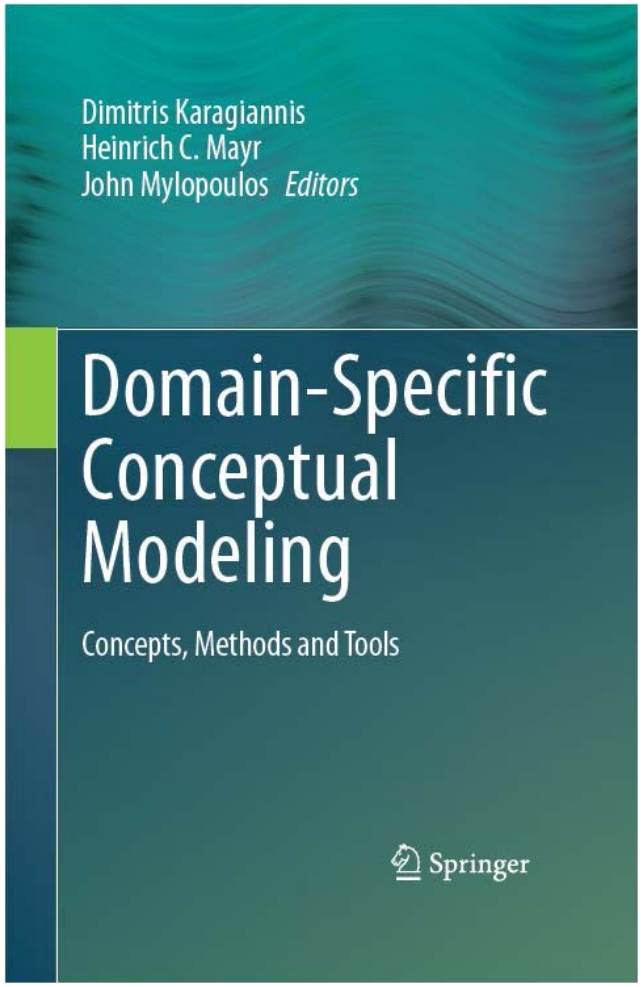
OMiLAB®.org Community



www.omilab.org

europe.omilab.org

OMiLAB® COMMUNITY RESULTS: Volume I of the OMiLAB Book

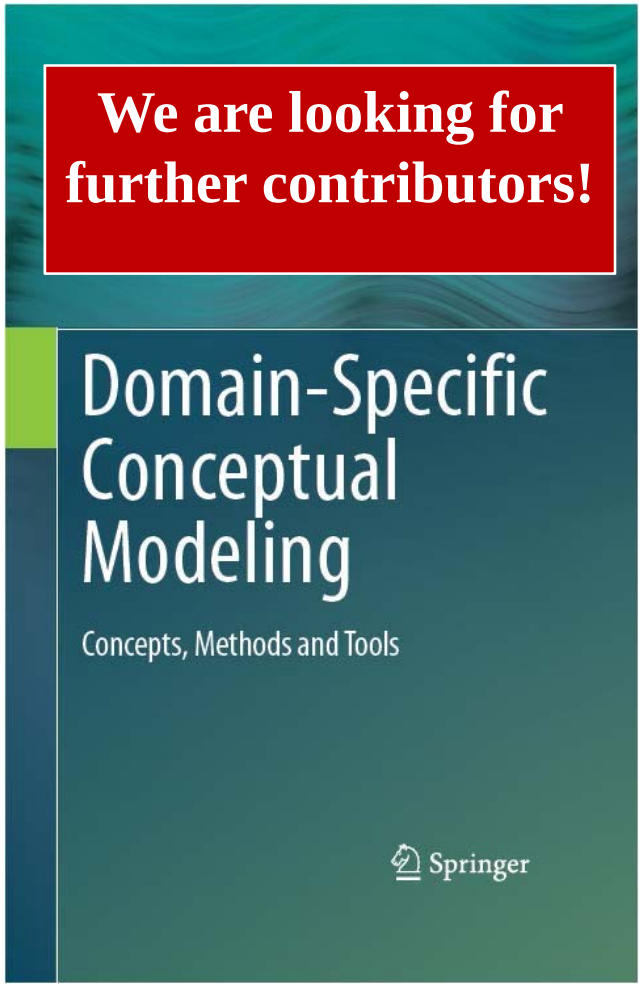


Further Details:
http://book.omilab.org

- This book draws new attention to domain-specific conceptual modeling by presenting the work of thought leaders who have designed and deployed specific modeling methods. [...].
- All domain-specific methods described in this volume also have a tool implementation within the OMiLAB Collaborative Environment - a dedicated research and experimentation space for modeling method engineering at the University of Vienna, […]

- Number of modelling methods/tools: 25
- Publisher: Springer

OMiLAB® Volume II of the OMiLAB Book



Tentative list of contributors:

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- Jin-Young Choi (Seoul, Korea)
- Kelly Garcés Pernett (los Andes, Argentina)
- Elyes Lamine (Albi, France)
- Dimitris Plexousakis (Crete; Greece)
- Oscar Pastor (Valencia, Spain)
- Kurt Sandkuhl (Rostock, Germany)
- Stefan Strecker (Hagen, Germany)
- Jan Vanthienen (Leuven, Belgium)
- Robert Winter (St. Gallen, Switzerland)
- Heinz Züllighoven (Hamburg, Germany)

- Number of modelling methods/tools: approx. 25
- Publisher: Springer

NEMO Summer School

2014	2015	2016	2017

OMiLAB® Community Contributions

OMiLAB is continuingly searching for new collaborators. Different levels of collaboration are possible:

- Operating a full OMiLAB®
  - Provide a physical and virtual laboratory for modelling method engineering and tool development
  - Act as the primary contact for researchers in the local area
  - Provide trainings in method engineering and tool development
- OMiLAB® Associated Organization
  - Include the OMiLAB in research and education activities
    - Development of Modeling Methods
    - Publications
    - Conferences, Workshops, Tutorials, Trainings
    - Courses
    - NEMO Summer School participation and exploitation

OMiLAB® ENVIRONMENT

Technological Environment consists of

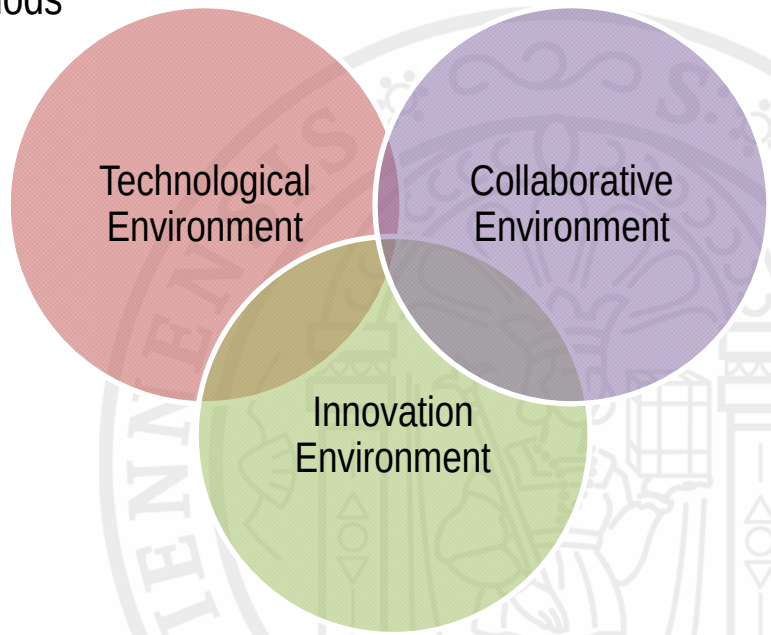
- Core (Open Use): ADOxx on OMiLAB, ConceptBase
- Packaging and professional deployment capabilities
- Add-Ons (Open Source): implemented community tools such as Model Annotator, GraphRep Generator, Model Publisher, Method Publisher, OM-Repository, Meta-Model Browser, MLEA – Modelling Language Engineering Assistant

Innovation Environment provides

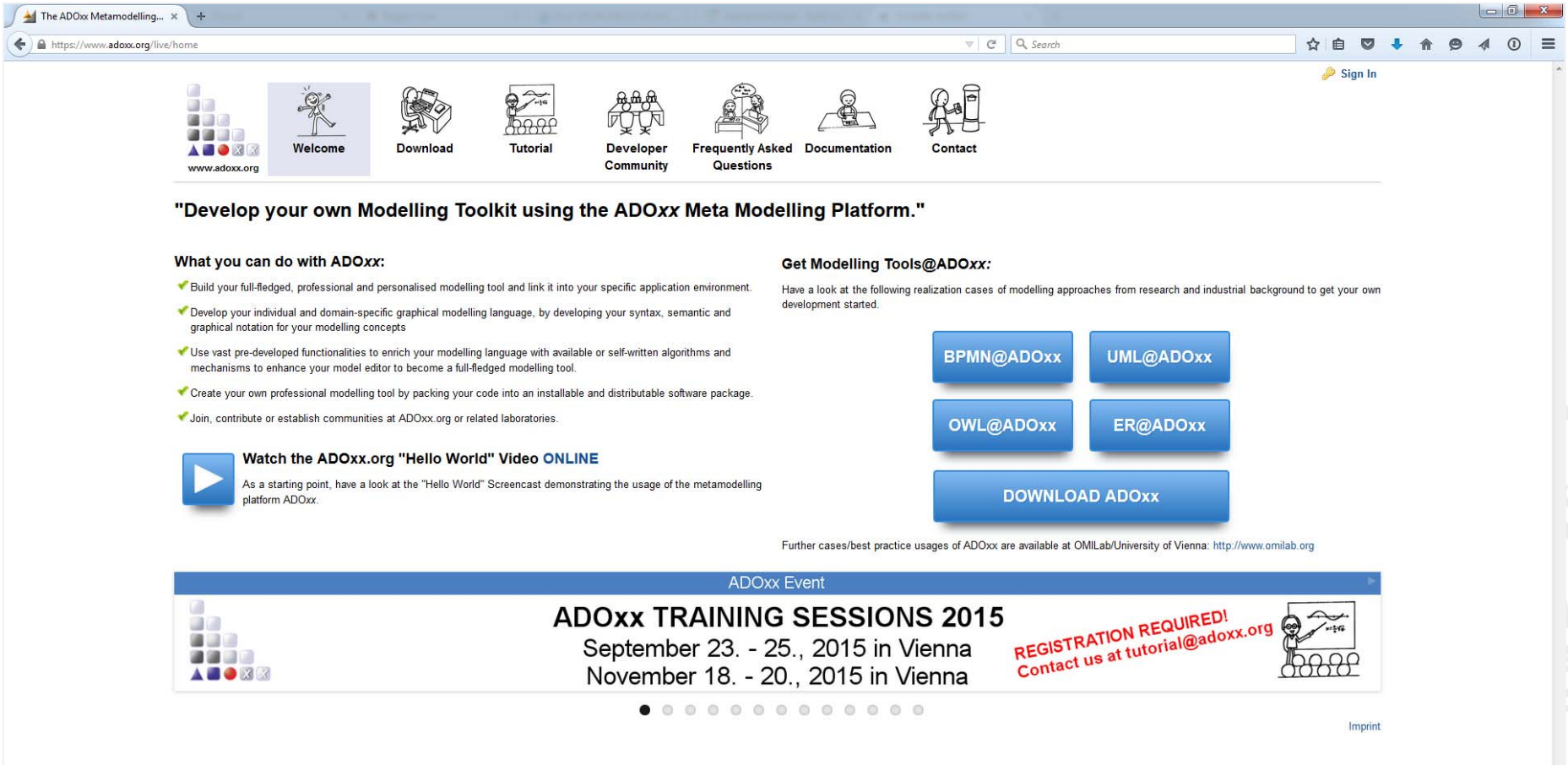
- Methodological guidance in the design of modelling methods
- Best practices and tools to foster efficiency
- World-wide network of modelling enthusiast and experts

Collaborative Environment provides

- Web-platform (virtual and physical accessibility)
- Community events like **conferences**, workshops, **summer schools**
- **Publications** like books, conference and journal papers
- Networking activities, newsletters, media and OM-TV

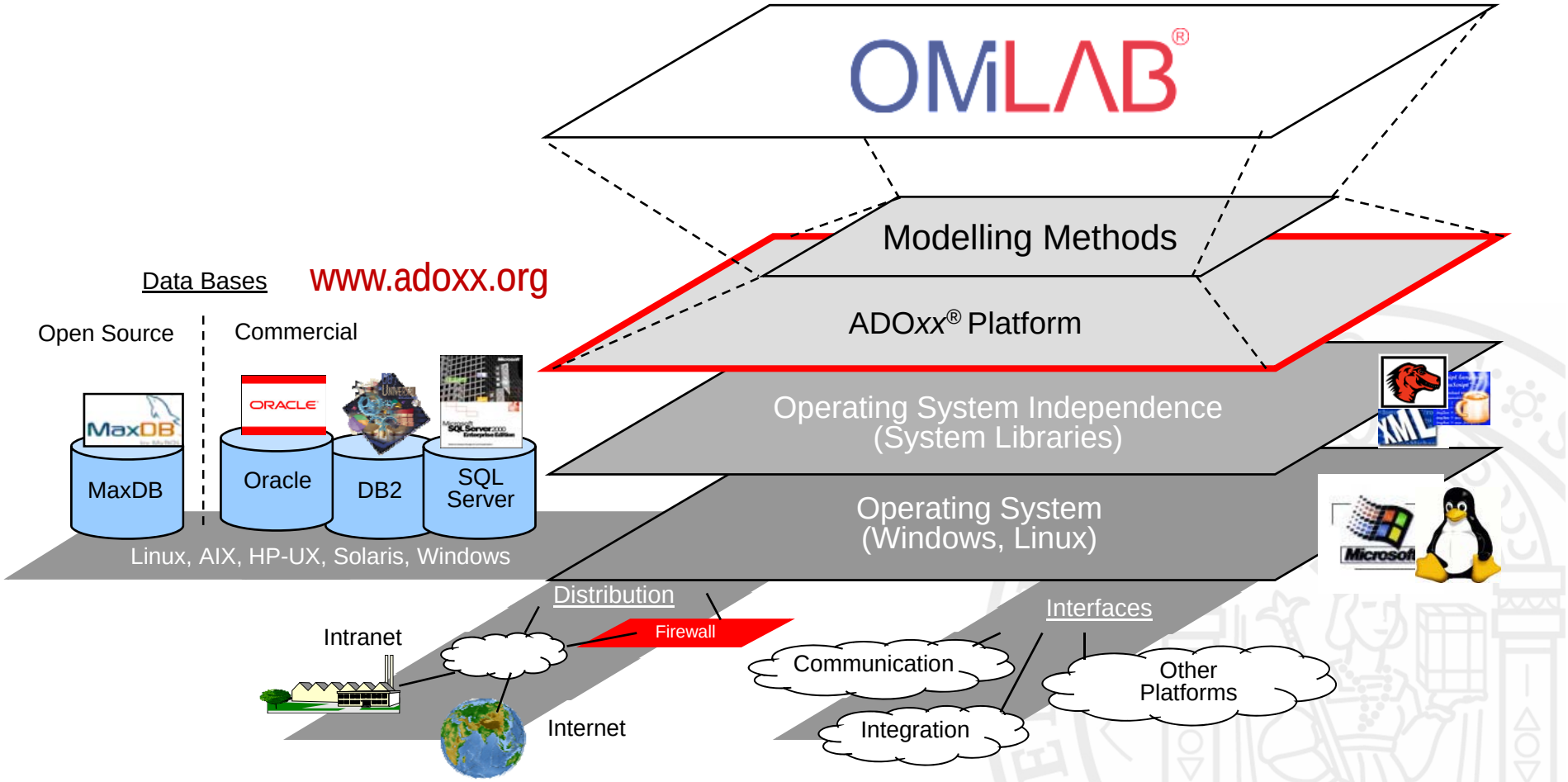


ADOXX.ORG: META MODEL PLATFORM & DEVELOPER COMMUNITY

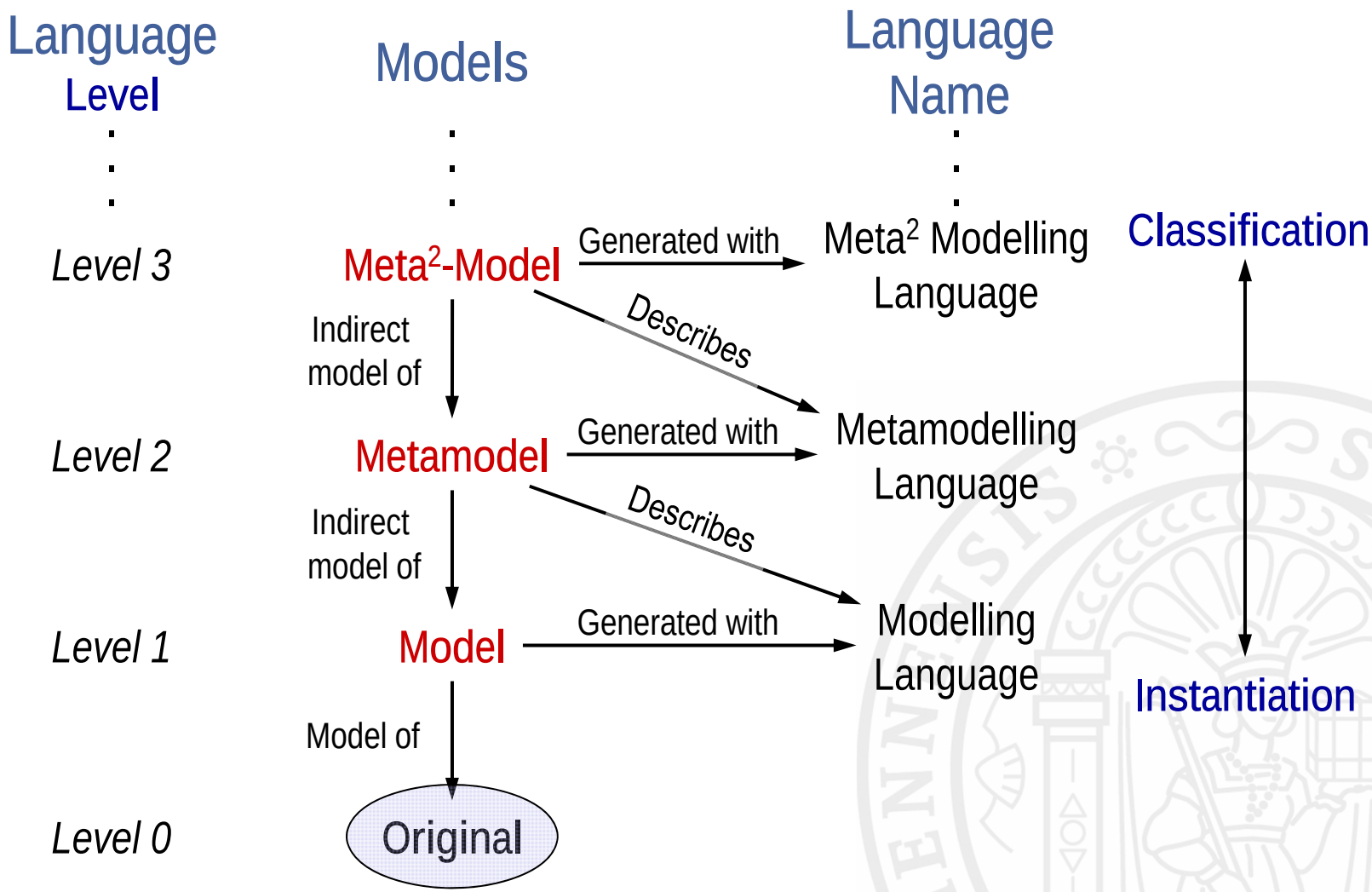


www.adoxx.org

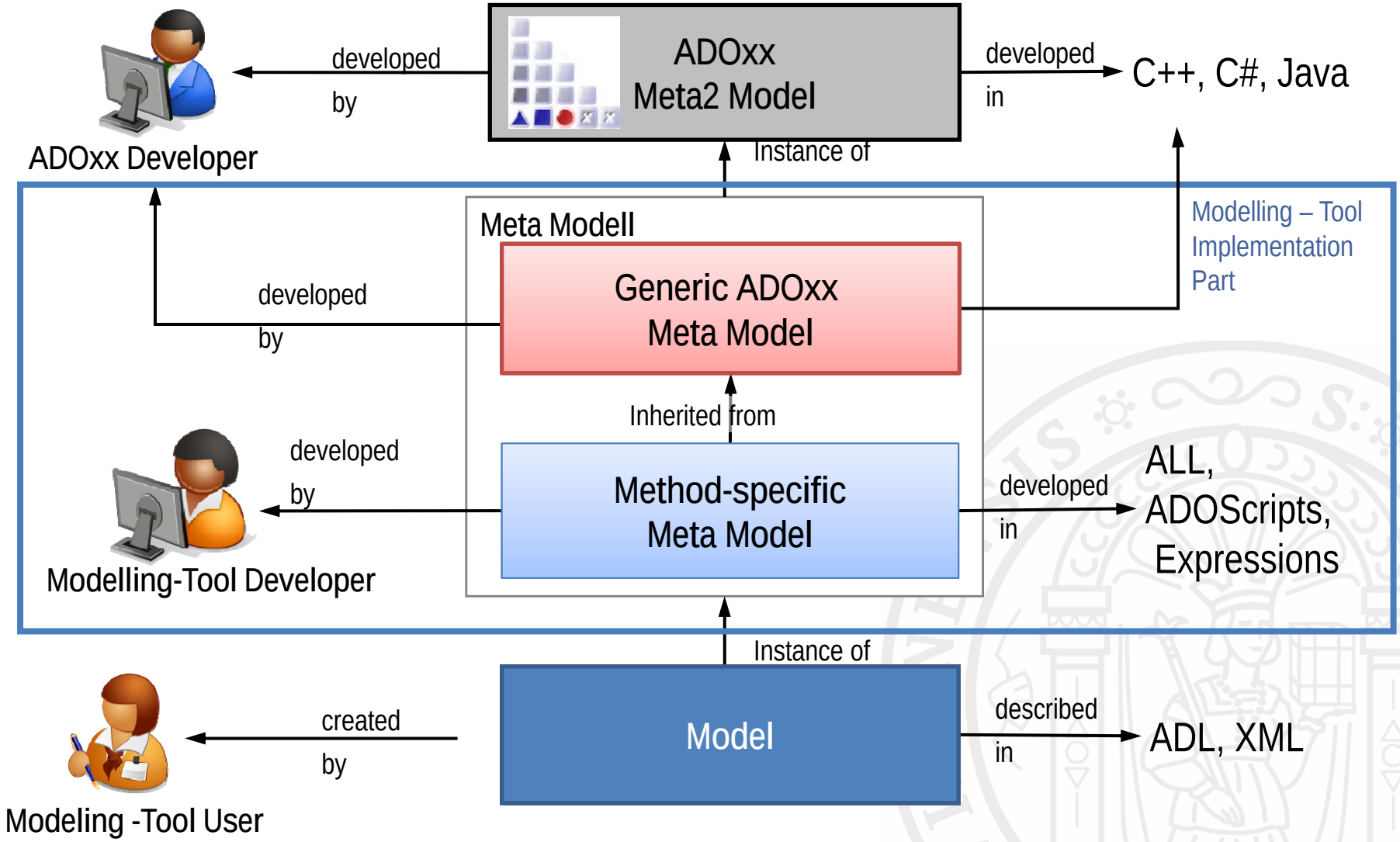
OMILAB: CORE DEVELOPMENT ENVIRONMENT



META-MODELING AS A CONCEPT



DEVELOPMENT ROLES PER META MODELLING LAYER



GOAL: Development of Modelling Toolkit

Menubar

Actionbar

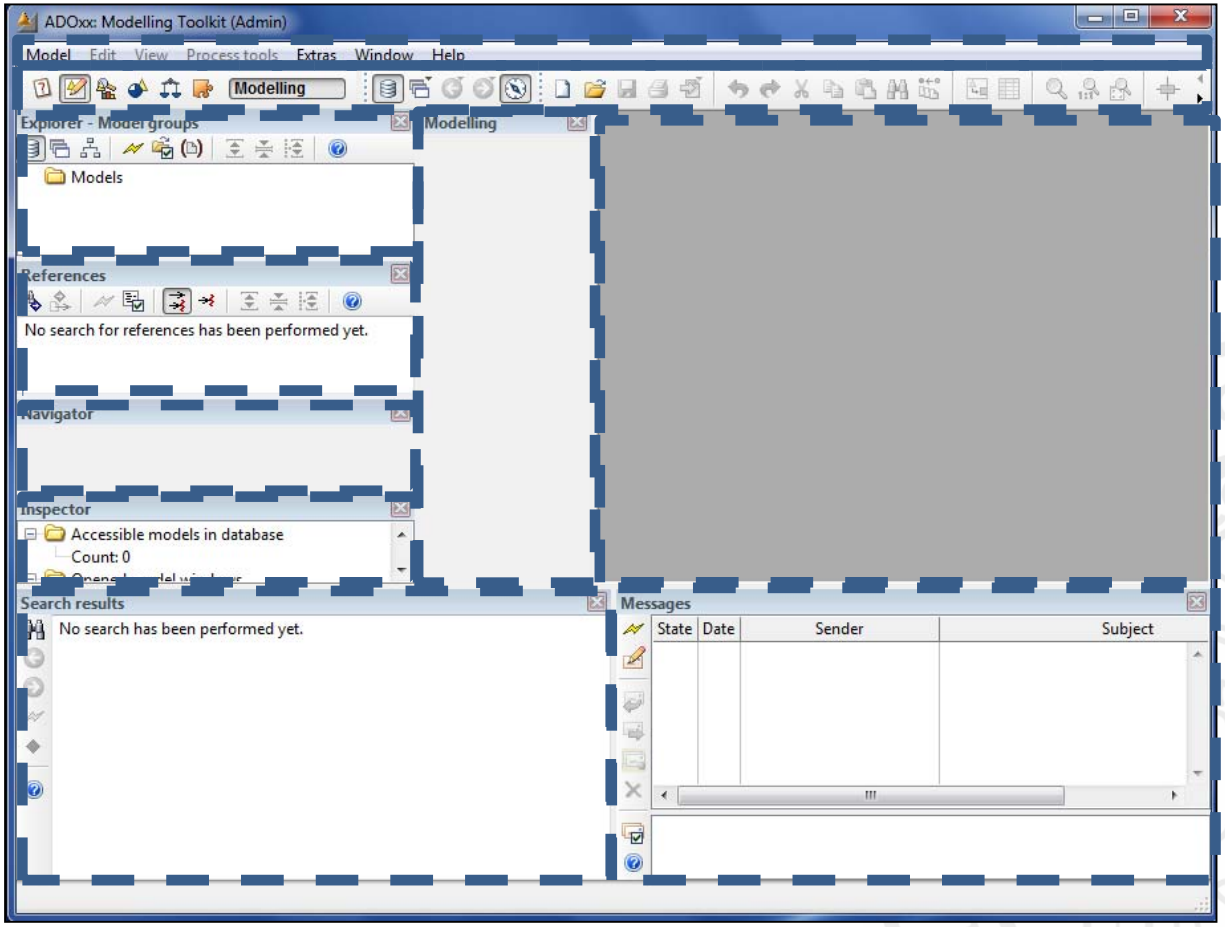
Explorer

References

Navigator

Inspector

Search Results



Modelling

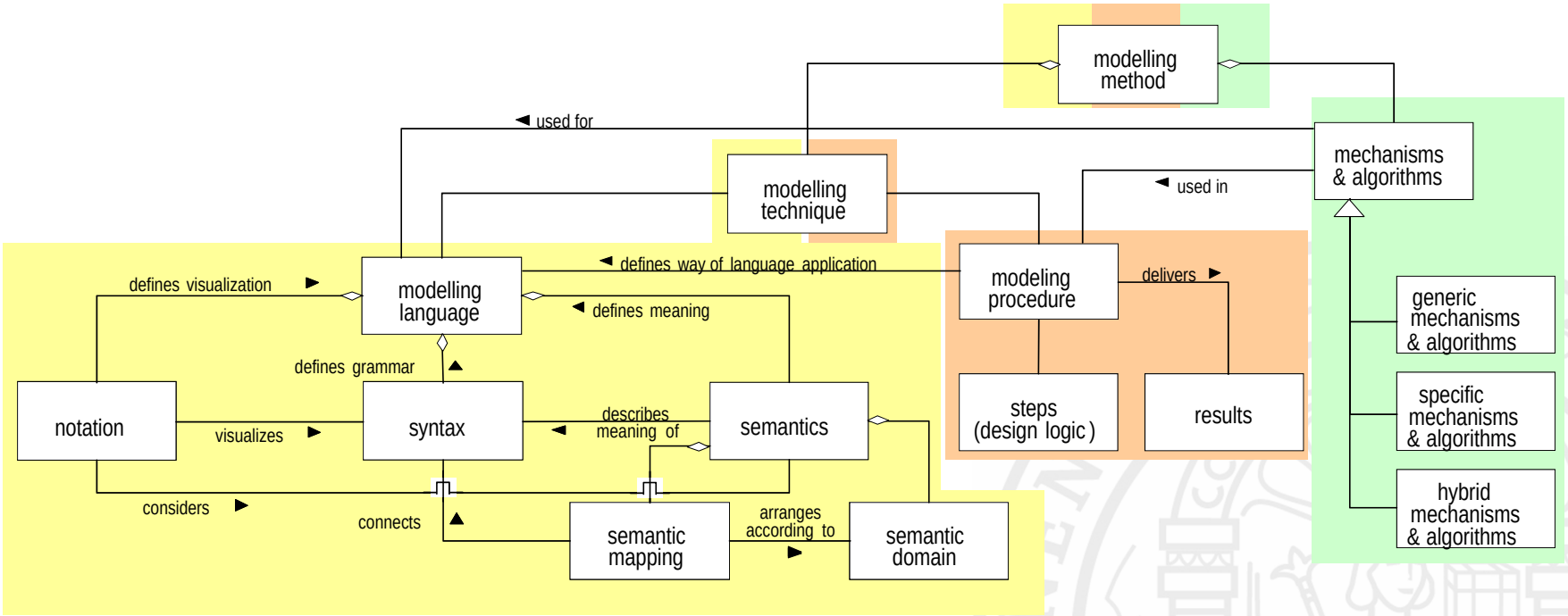
Drawing Area

Messages

The *AMME* Approach

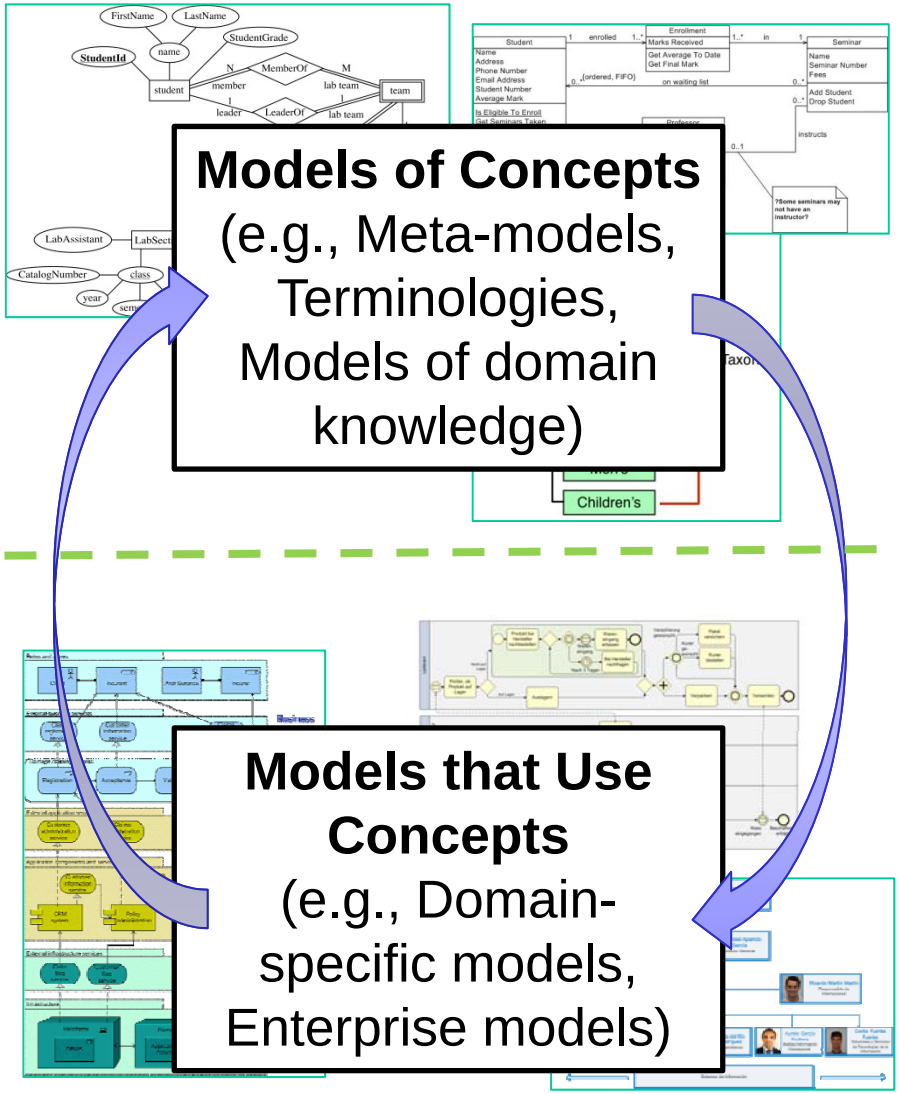
AGILE MODELLING
METHOD ENGINEERING

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.

BACKGROUND: PRODUCE-USE CYCLE



Models of Concepts
(e.g., Meta-models, Terminologies, Models of domain knowledge)

Tool and Method Repository
(for domain-specific modelling)

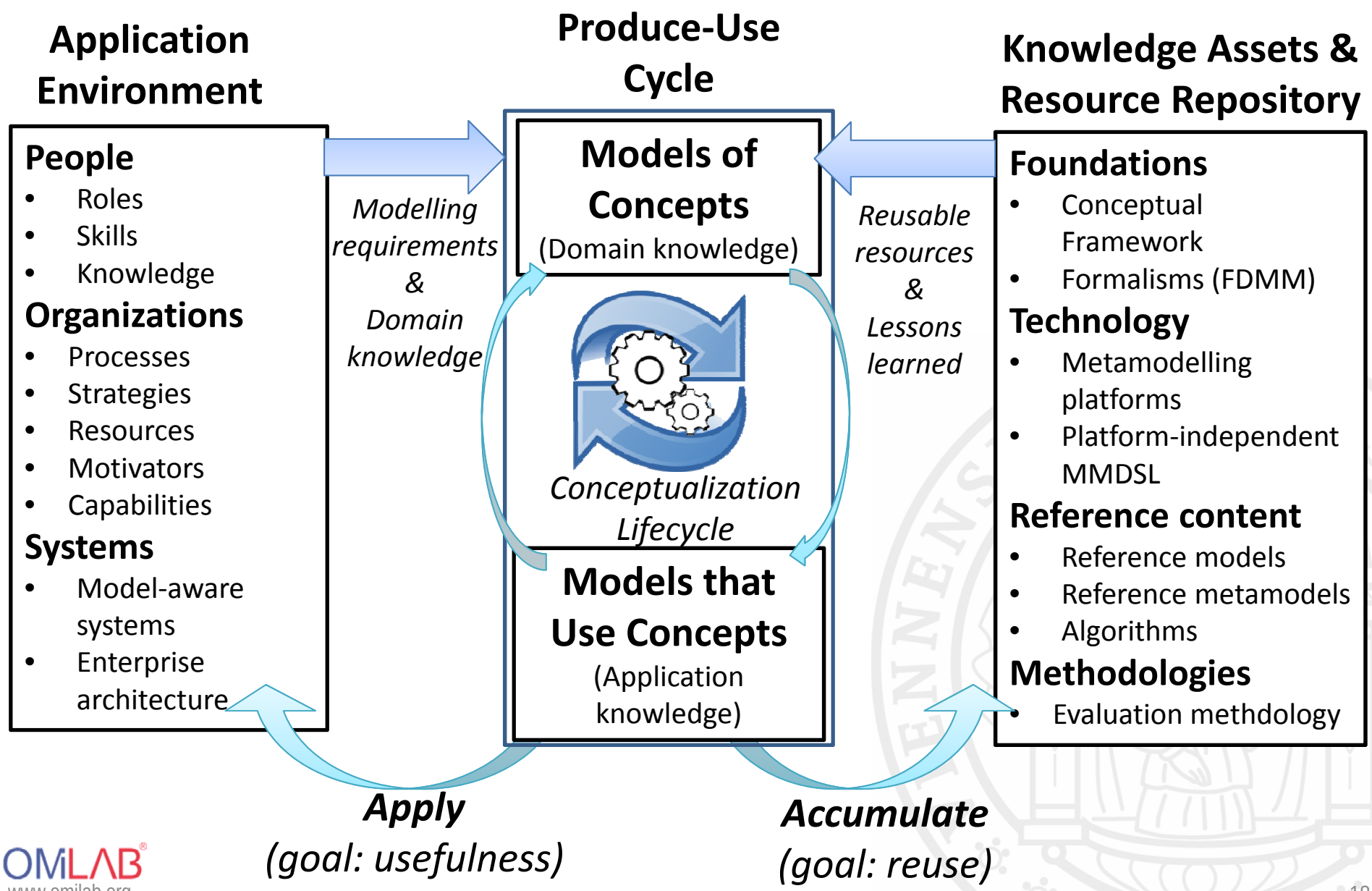
Models that Use Concepts
(e.g., Domain-specific models, Enterprise models)

Models and Content
(domain-specific knowledge codified in diagrammatic conceptual models)

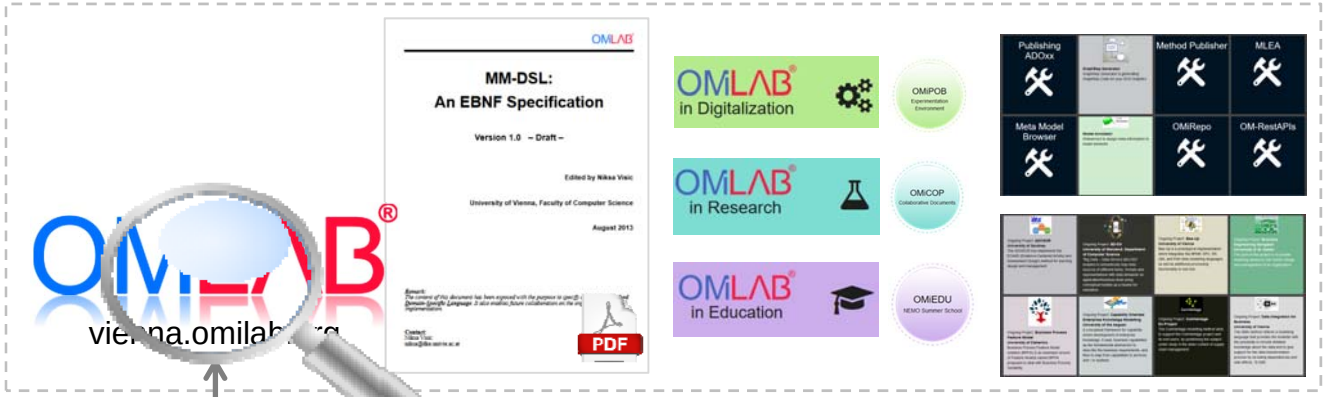
Evaluate to Produce

Instantiate to Use

The AMME Framework



ADOxx USAGE PATHS



OMLAB®
korea.omilab.org

OMLAB®
vienna.omilab.org

Proof of Concept
Modelling Tool Conceptualization

DSM
Domain-Specific Modelling

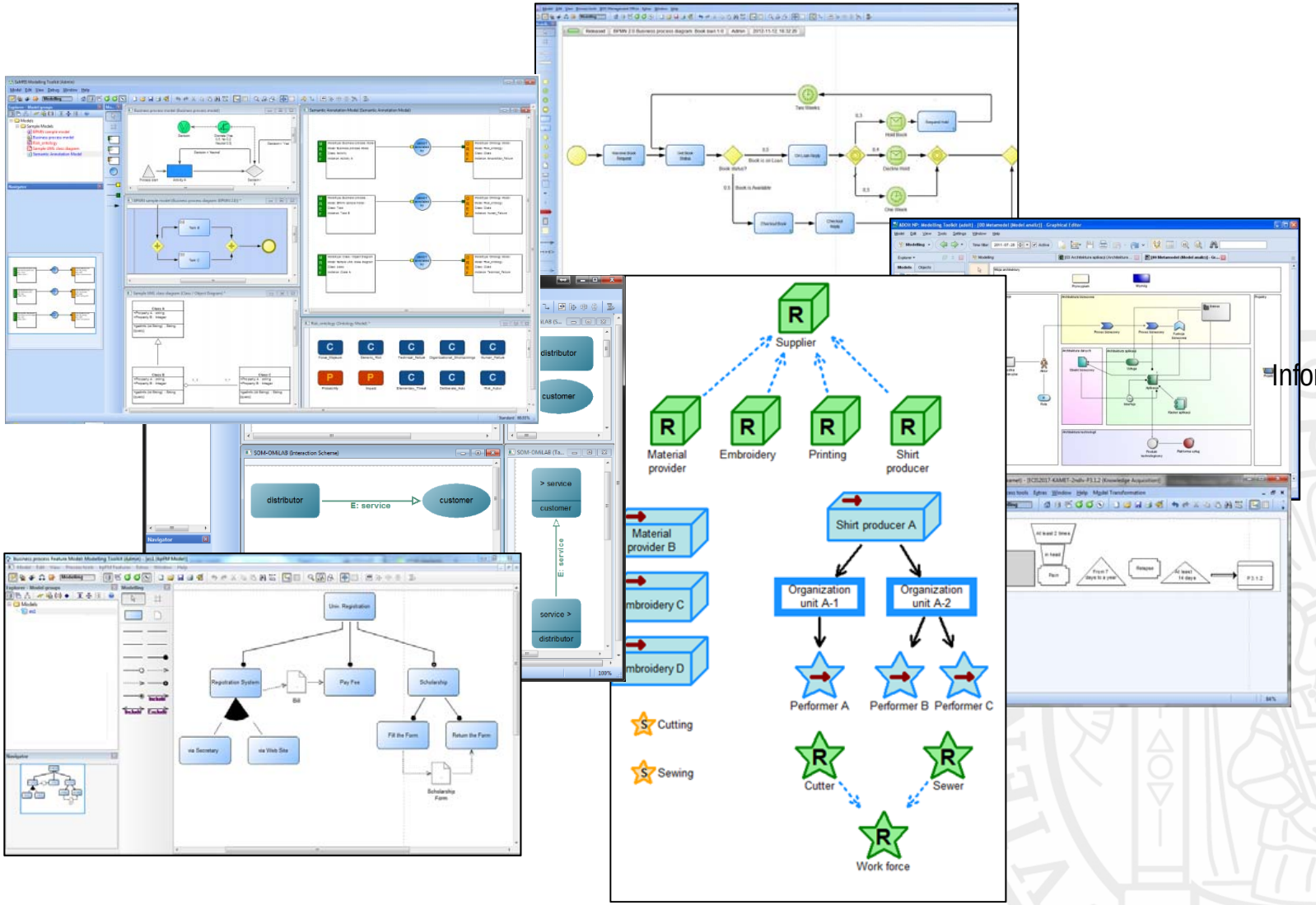
Open-Use
Development Environment

ADOxx
Meta Modelling Platform

ADOxx.org

ADOxx Community Edition

SUCCESSFUL MODELLING TOOL IMPLEMENTATIONS



ADOxx Horus Method
BEE-UP
BEN
BIM
BWW
CIDOC
ComVantage
COPROM
DIBA
EC
eduWeaver
eGPM
EKD
IMP2.0
Information Security
iStar
iStarSuperSet
JCS
MeLCa
MoLAP
MoSeS4eGov
OKM
OMiStarT
PetriNets
pmSOA
PROMOTE
SDbD
Secure Tropos
SemFIS
SOM
VLML

OMiLAB
www.omilab.org

http://www.omilab.org/psm/content/ep/globalnetworkservice?view=tilestools

OMiLAB DOMAINS

Created with Wordle, http://www.wordle.net

THE START-UP WITHIN OMLAB®:
A *Free Contribution*
for the Community

START-UP PACKAGE:
Training, Content and FAQ

Modelling Method

Implementation based on ADOxx.org

Proof of Concept

Information Channels

Free Training

Presence Trainings, Webinars

Free Implementation

Implementation Examples, Cases

Free Specification and Approach

AMME, MM-DSL, FDMM, …

START-UP PACKAGE: Training Curriculum

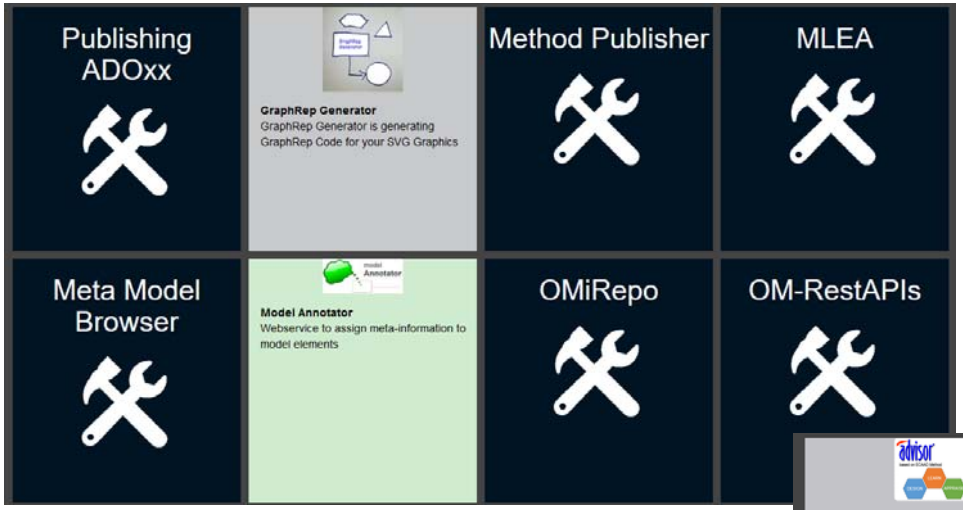
- Introduction
- Setup of Implementation Environment

- Modelling Language Implementation
  - Classes
  - Relations
  - Class Attributes and Attributes
    - GRAPHREP
    - ATTRREP
    - CLASS Cardinality
    - CONVERSION
    - Model Pointer
  - Attribute Facets
  - Model Types

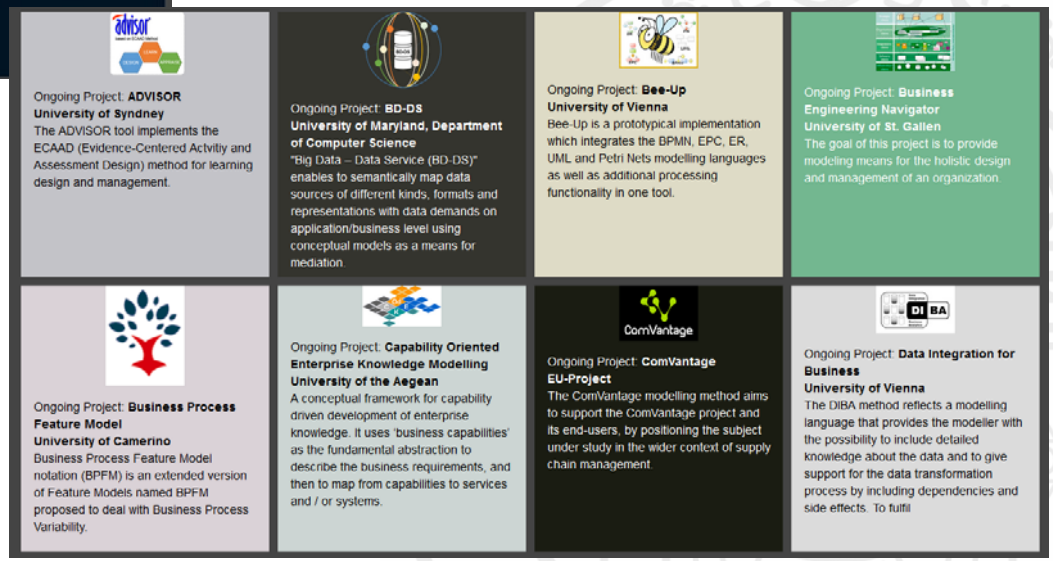
- Mechanisms & Algorithms Implementation
  - Core Functions for Model Manipulation
    - Database
    - Visualisation
    - Query
    - Transformation
  - Configuration of ADOxx Components
    - Visualisation
    - Query
  - External Coupling ADOxx Functionality
    - ADOscript Triggers
    - ADOscript Language Constructs
    - Visualisation AdoScripts
    - Visualisation Expression
    - Query ADOscript
    - Transformation ADOscript
  - ADD-ON Implementation
    - ADOxx Web-Service
    - XML / ADL Import – Export
    - ADOscript Batch Mode

START-UP PACKAGE: Available Content

(Development Services, Implementation Projects)

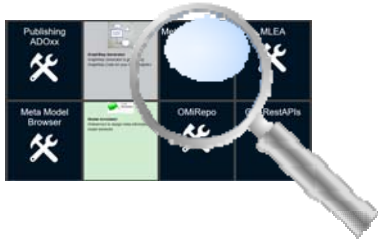


http://austria.omilab.org/psm/development



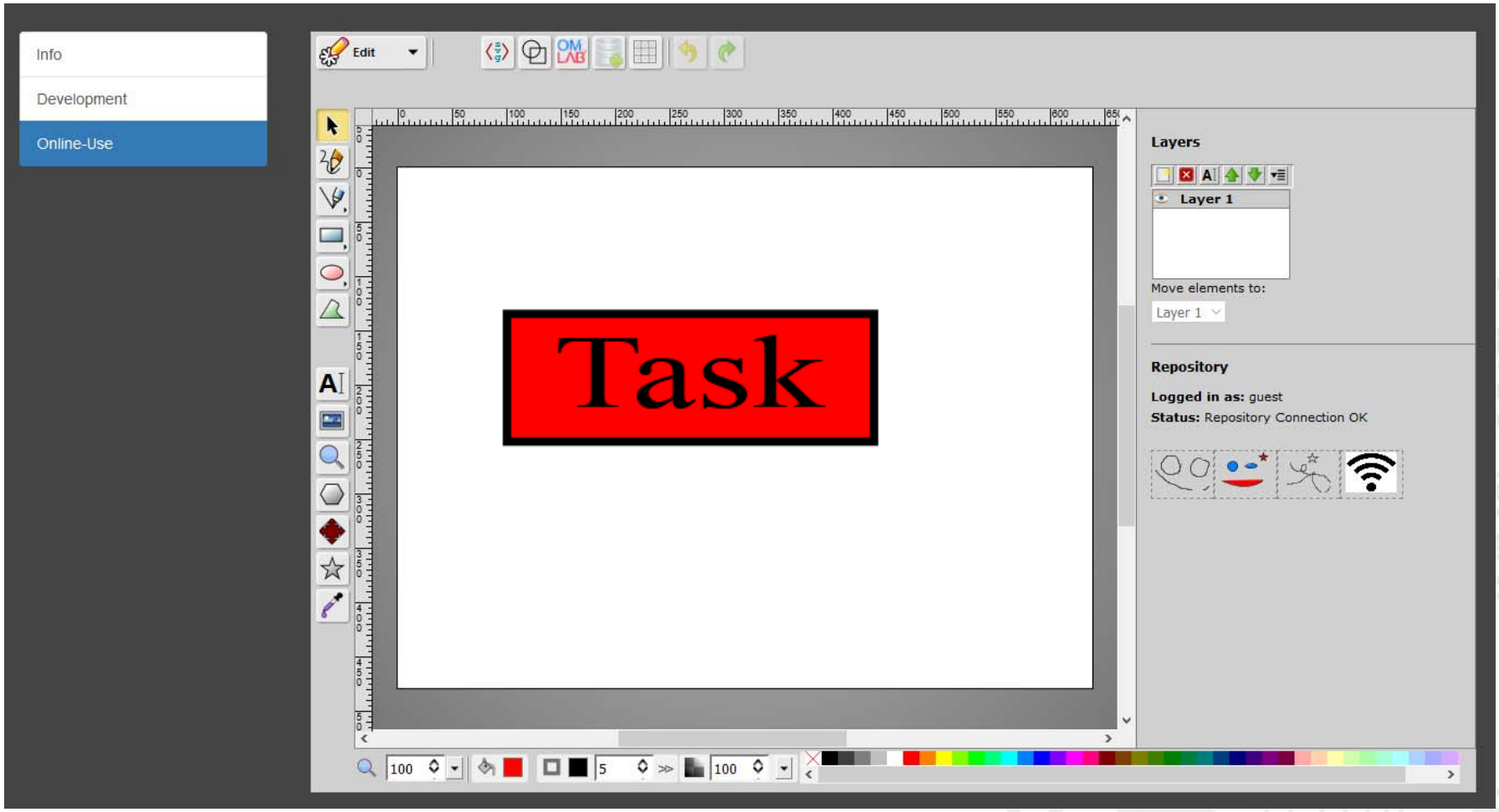
http://austria.omilab.org/psm/tools

START-UP PACKAGE: OMLAB® Development Tools

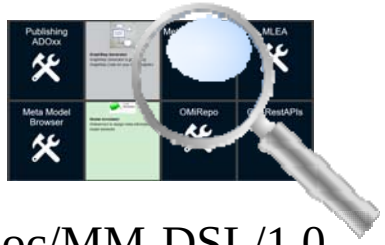


Example Development Tool: Graphical Representation Design

http://austria.omilab.org/psm/content/Graphrep/iframe?view=Developer-Online



START-UP PACKAGE: OMLAB® MM-DSL



- Grammar of the DSL publicly available
- Formal specification through EBNF
- Ready for custom-developed extension
- **Feedback and requests to grammar are highly welcome!!**

http://www.omilab.org/doc/MM-DSL/1.0

OMLAB®

MM-DSL:

An EBNF Specification

Version 1.0 – Draft –

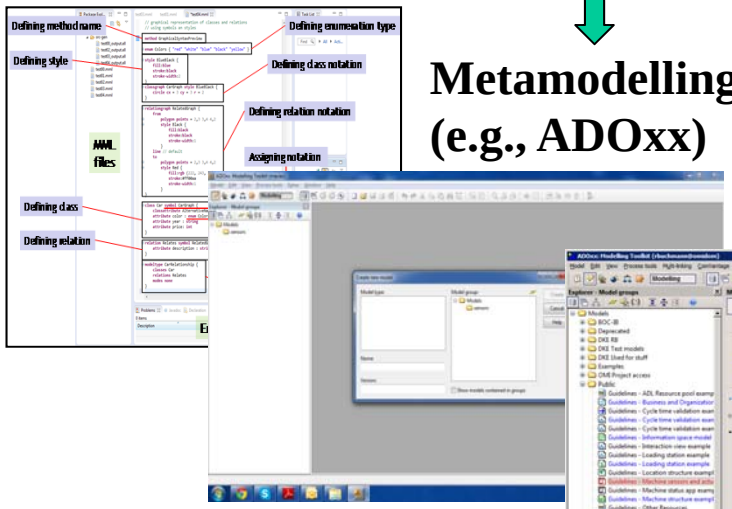
Edited by Niksa Visic

University of Vienna, Faculty of Computer Science

August 2013

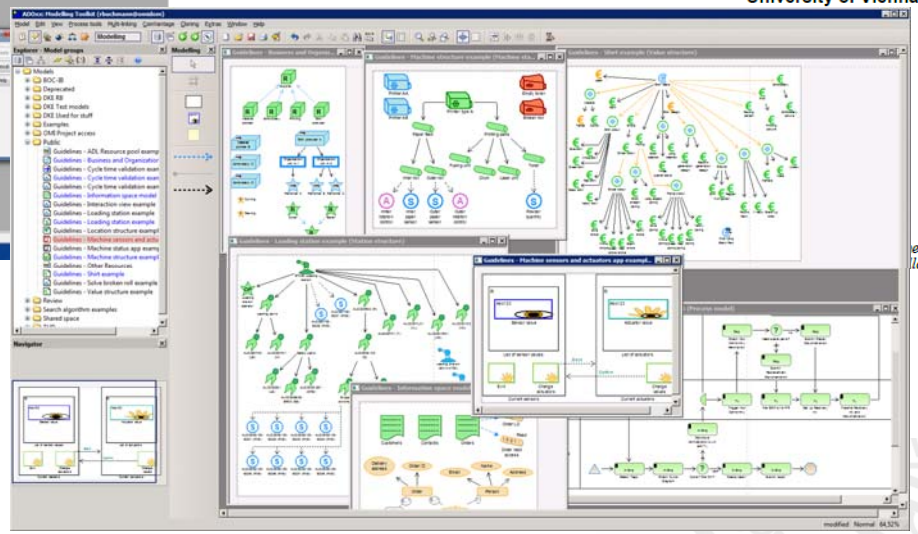
e purpose to specify a Modeling Method
laboration on the ongoing research and

MM-DSL



Metamodelling platforms (e.g., ADOxx)

Modelling tool



EXPLOITATION OF RESULTS:

Research Projects & Education

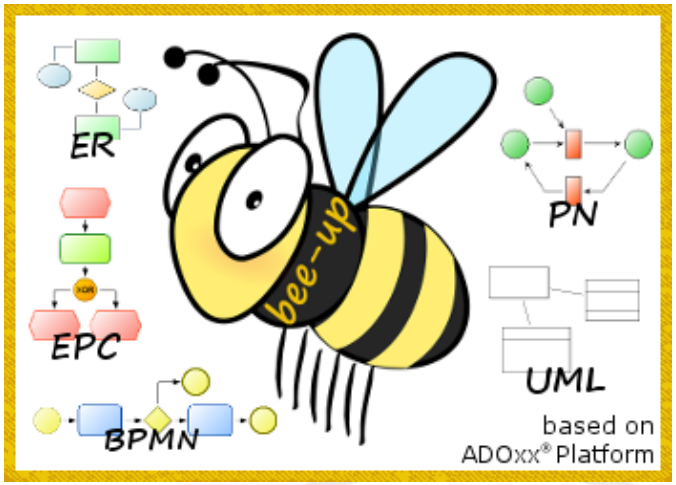
within OMLAB®

OMiLAB® IN EDUCATION: For Lecturing

BEE-UP

A collection of "classical" modelling languages employed in different domains, e.g. software and systems modelling, business process modelling, and data modelling.

The tool aims to be support university teachers in basic conceptual modelling courses. It currently supports the following modelling languages:



Business Process Model and Notation 2.0 (BPMN)

Event-driven Process Chains (EPC)

Entity-Relationship (ER)

Unified Modeling Language 2.0 (UML)

Petri-Nets (PN)

OMiLAB in Education: A collection of modeling tools which have been developed in university courses and/or tools that have been specifically developed for teaching purposes.

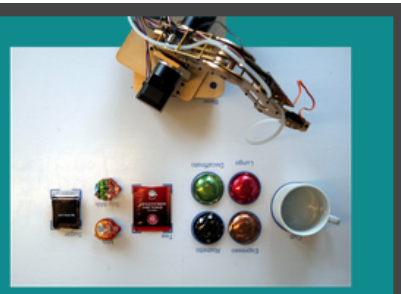
www.omilab.org/bee-up

OMiLAB® IN EDUCATION: For Theses

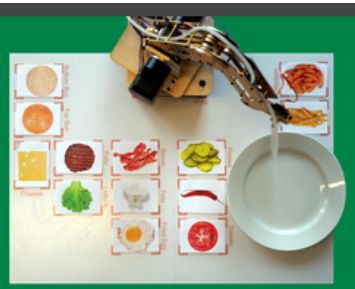
OMiLAB® encourages and supports students in writing their thesis in topics related to method conceptualization, metamodeling, digitalization, and tool development.

- PhD Theses, e.g.,
  - 'A Development Method for the Conceptual Design of Multi-View Modelling Tools with an Emphasis on Consistency Requirements'
- Master Theses, e.g.,
  - 'Conceptualization and Implementation of a Constraint-Modeling Language'
  - 'Integrating Natural Language Processing with Semantic-based Modeling'
  - 'The business rules method - a modelling method for adaptive processes'

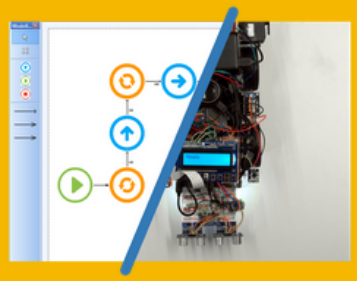
OMLAB® RESEARCH PROJECTS: Digitial Transformation



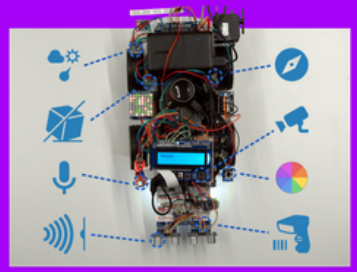
Use Case: Interact with different real world objects
***Approximation* Problem:** Items have a complex shape in 3 dimensions



Use Case: Assemble a product by incorporating components
***Planning* Problem:** Reaching th state in a complex environment

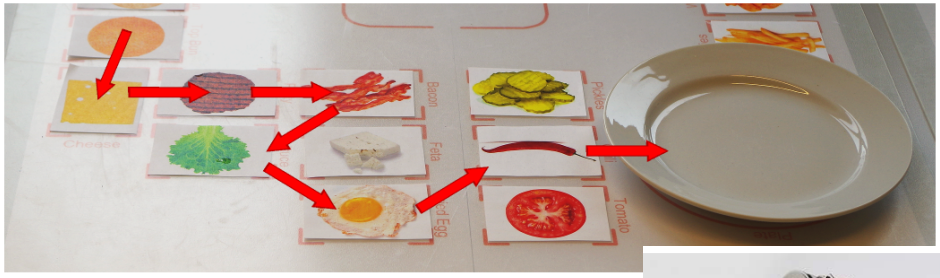


Use Case: Capture characteristics of a system without irrelevant details
***Modeling* Problem:** Finding the right degree of *domain-specificity*



Use Case: Enable new experiences for users with context aware devices
***Sensor Fusion* Problem:** Integrate sensor information in a consistent model

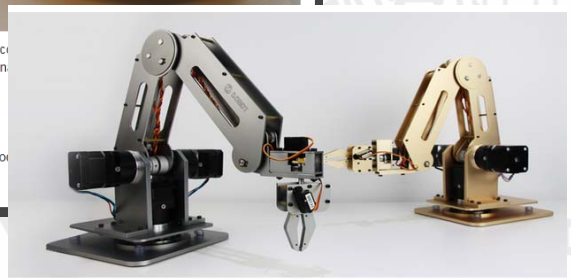
Use Case



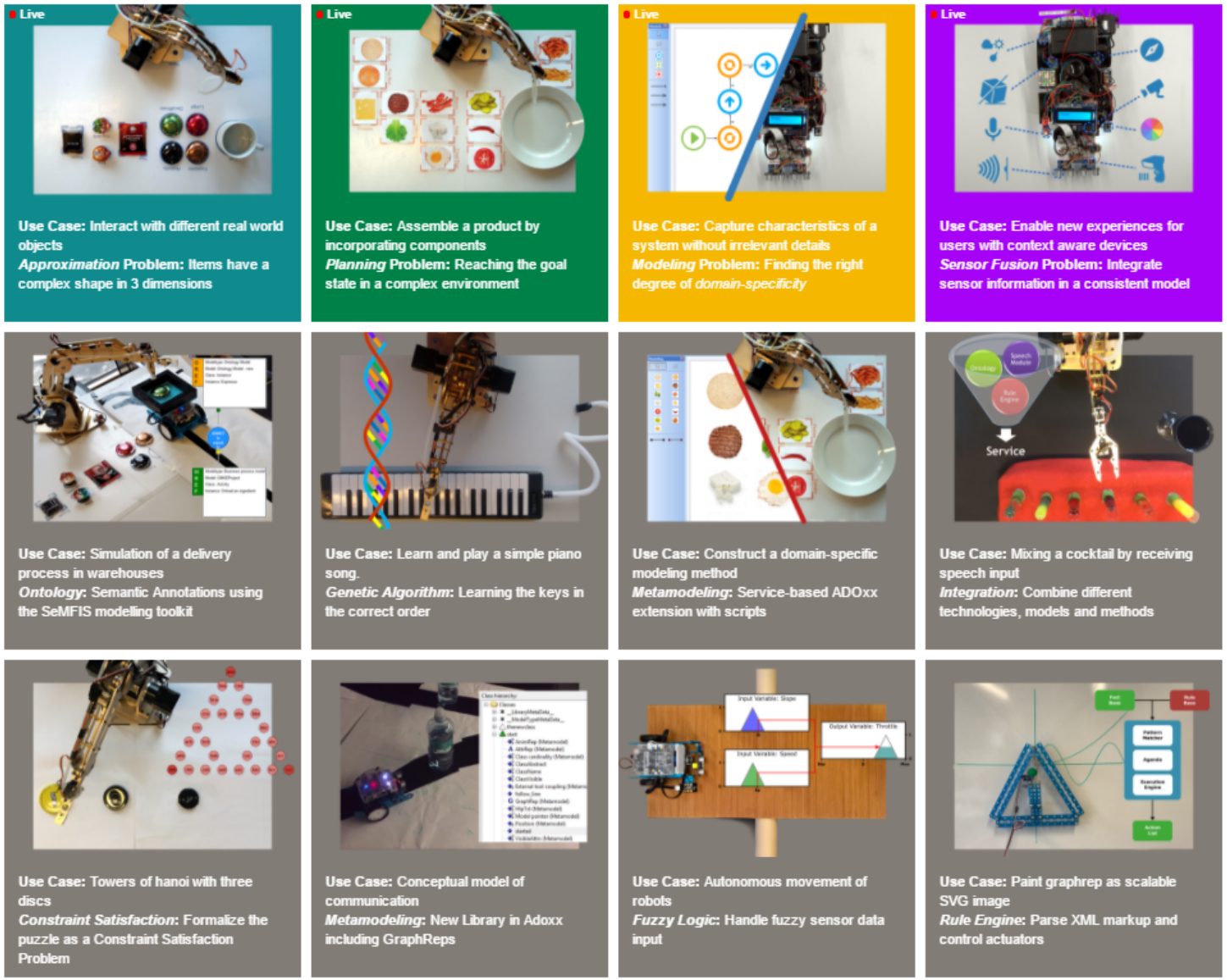
Processes in systems of interacting components require more knowledge than the knowledge of each individual c
that more and more processes will be goverened by computational paradigms in the future. Because computation
for this experiment is to validate instances of

- **Production Systems** and
- **Process Models**.

Production Systems contail knowledge that is formalized into a set of rules and mechanisms to achieve goals. Pro
explanatory knowledge formaizations that often rely on domain-specific modeling methods.



OMiLAB® RESEARCH PROJECTS: Digitial Transformation



http://austria.omilab.org/psm/omirob

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THANK YOU FOR YOUR ATTENTION!