SEPP/OT as a Management Concept for the Modeling of Workflows

Wolfgang Fengler, Andrea Karg

Angela Mühlpfordt

Technical University of Ilmenau,
Germany

Martin Wolf

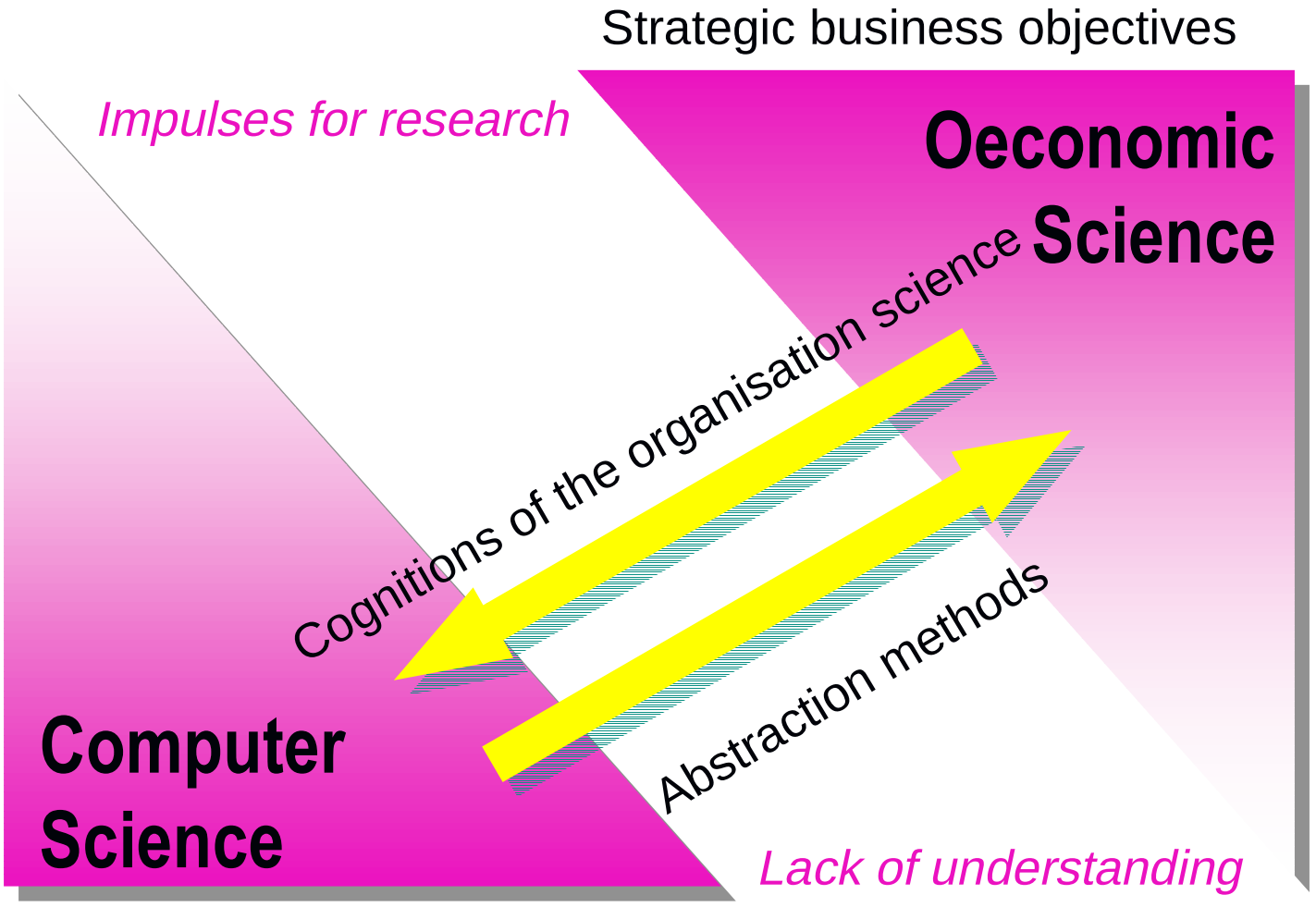
OWiS Software GmbH, Ilmenau, Germany

TU Ilmenau

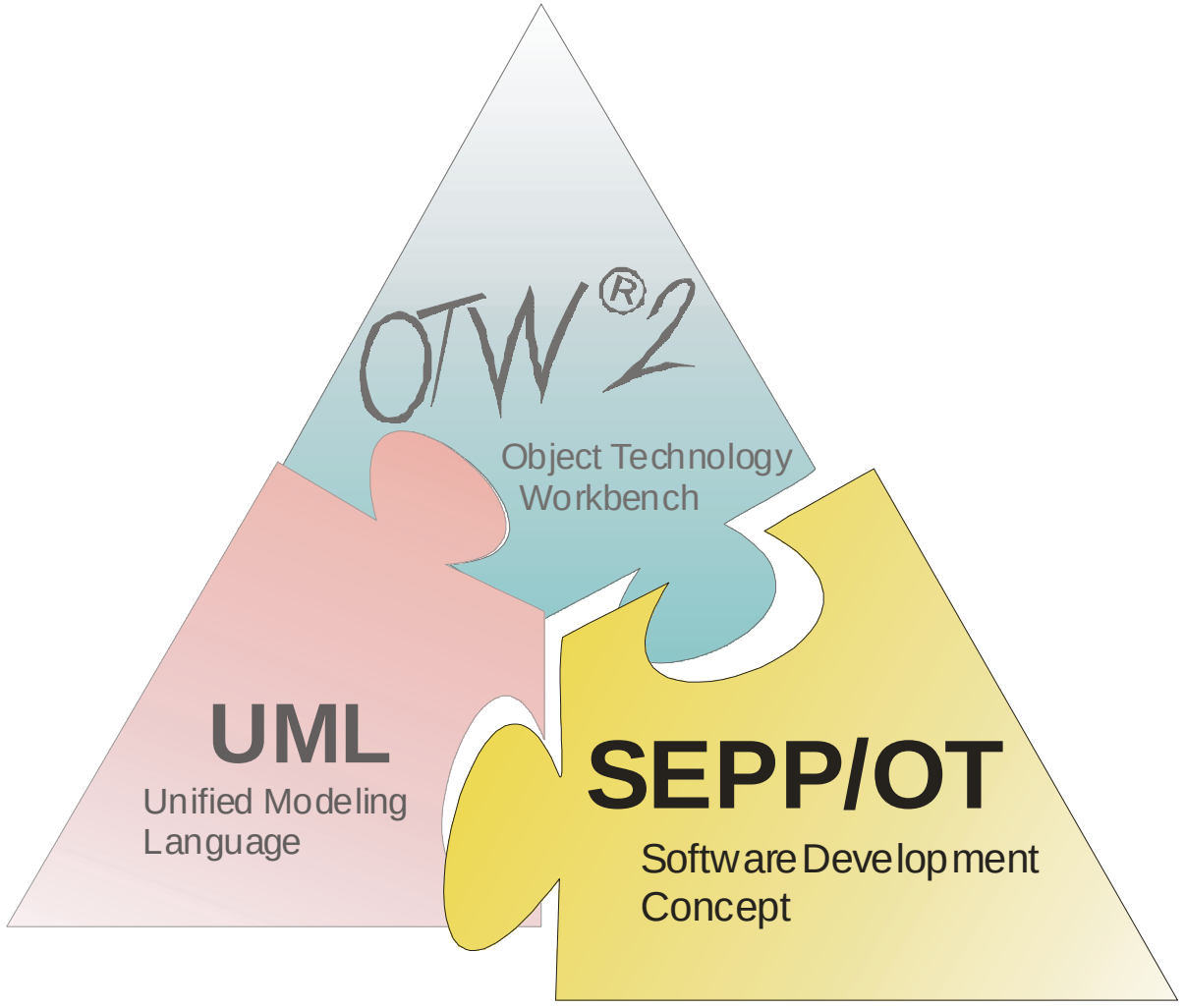
Topics

1. Introduction
2. SEPP/OT as a UML based Model for the Software Development Process
3. The Object Process Net (OPN)
4. SEPP/OT for the Modeling of Workflows
5. Tool Support
6. Summary and Further Work

Motivation


Strategic business objectives
Impulses for research
Oeconomic Science
Cognitions of the organisation science
Abstraction methods
Computer Science
Lack of understanding
Preparation of Tools

Extending the UML



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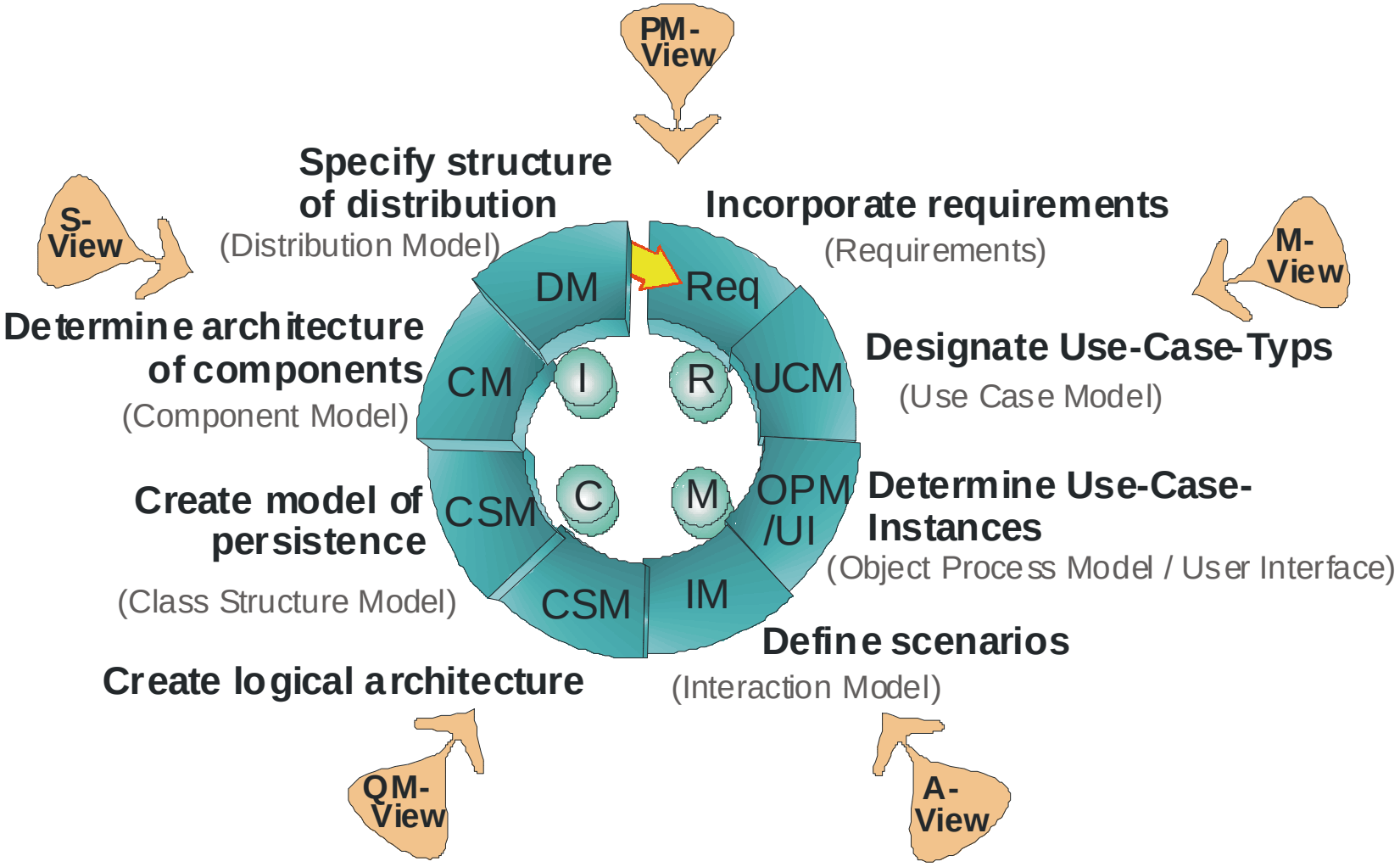
The SEPP/OT - Framework



Processes - The Four Columns of the Staircase

- **R** **R**equirements Specification
  - Collection of information
- **M** **M**odeling
  - Analyzation (what) and design (how) of the application
- **C** **C**ode Generation
- **I** **I**mplementation
  - not important for modeling of workflows

The Five Views from Outside

- **PM** **P**roject **M**anager‘s View
  - focus on management perspective
- **M** **M**ethodologist‘s View
  - focus on how is it done?
- **A** **A**daptability View
  - focus on reusability and adaptability of a model
- **QM** **Q**uality **M**anagement View
  - focus on quality control issues, assurance of quality standards
- **S** **S**ecurity View
  - focus on software security features

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Petri Net Based Method for OO Modeling of Processes

- *Inheritance*
- *Re-Use*
- *Polymorphism*

Object - Process - Net

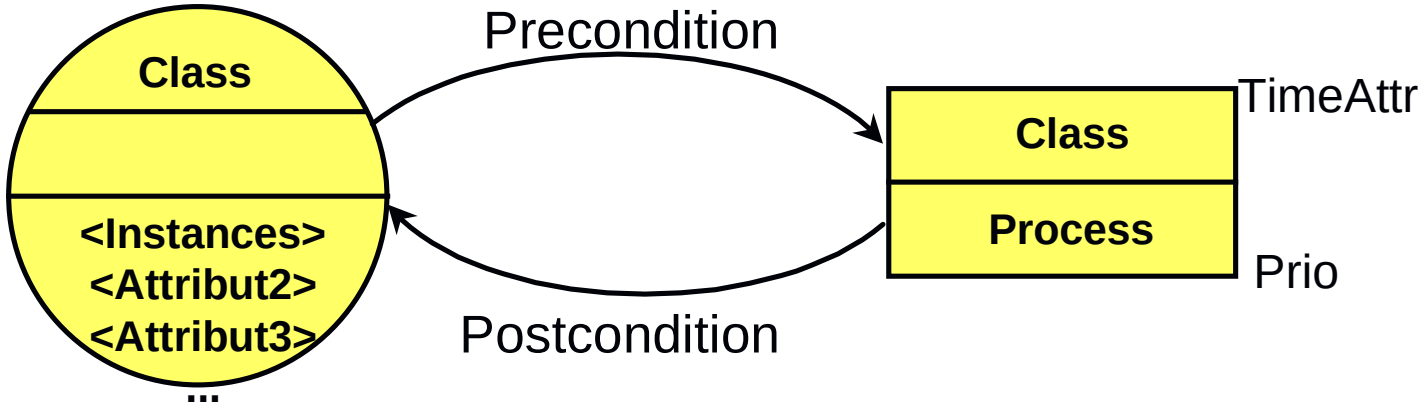
Description of the **dynamic aspects** of a system

- *Simulation*
- *Formalism*
- *Verification*

Object Process Net

Abstract object (class)

Process
method of the related class



directed arcs
conditions related to the attributes of the object

Color Classes of an OPN

- **ENUM**
  - comparable to an enumeration type. The finite set of values has to be defined by enumeration of all elements.
- **INT**
  - comparable to integers in programming languages.
- **SET**
  - comparable to a container class, which can only contain one copy of each element (or comparable to a mathematical set)
- **MULTISET**
  - comparable to a container class, which can contain more than one copy of each element (or comparable to a mathematical bag)

Operation / Operators

- **Value changing operations**
  - modify the values of attributes, resulting in a value of the same color class
  - e.g. **incr** or **decr** of INT-attributes
- **Testing operations**
  - check the value of an attribute, resulting in an BOOLEAN value
  - e.g. test for **equality** or **inequality**

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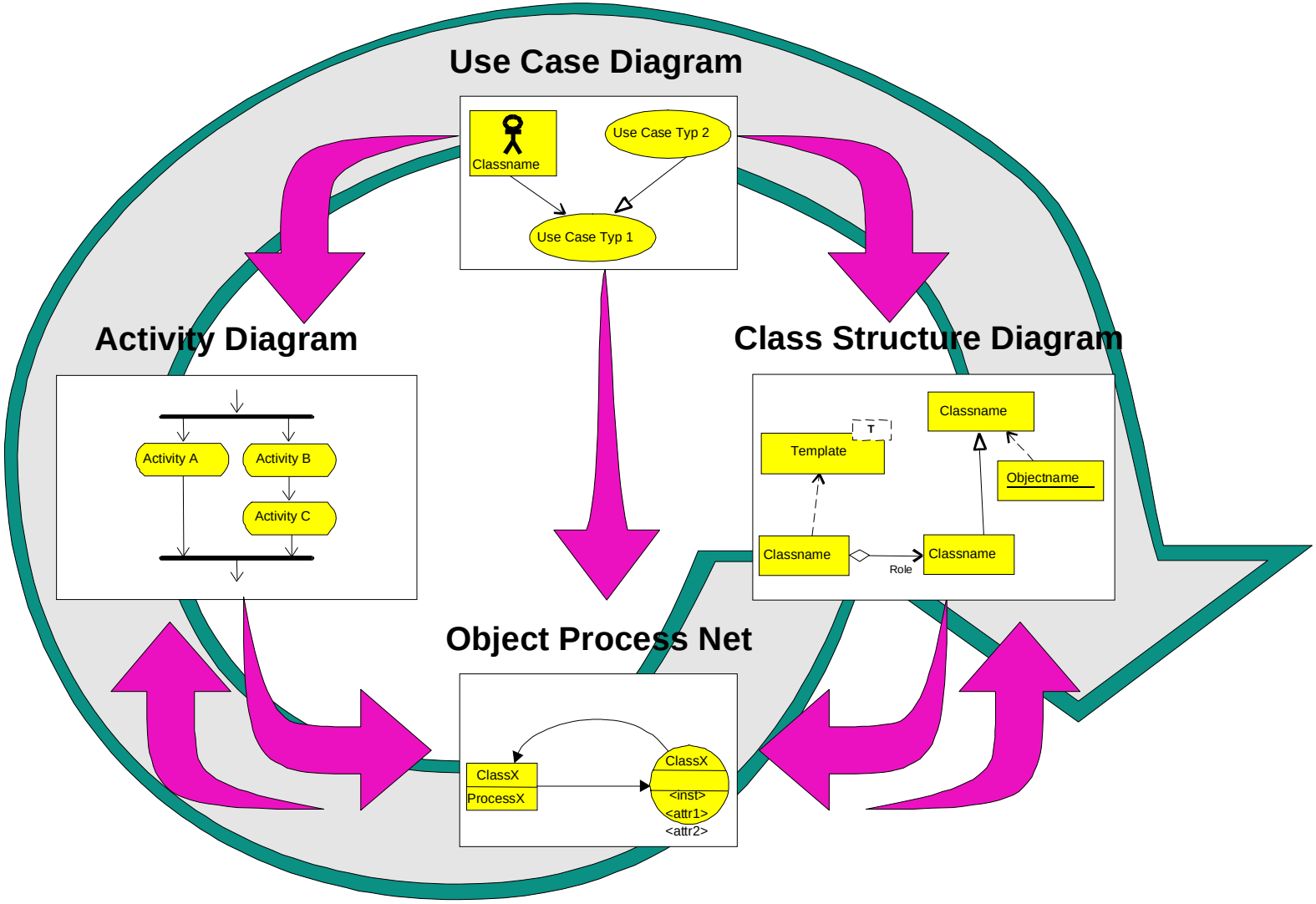
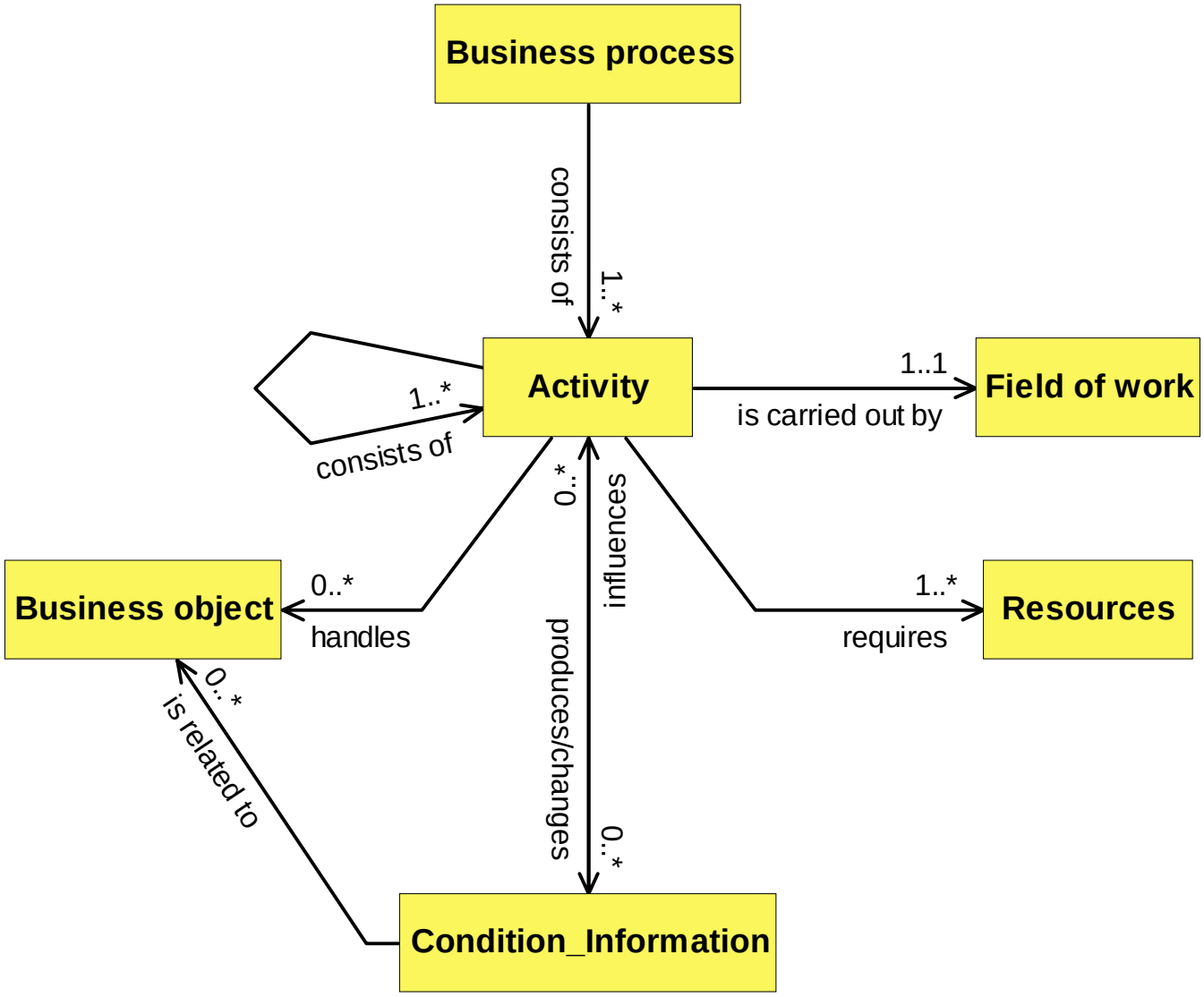
Creating a Business Process Model



Meta-model for business processes



Elements of the Meta-Model are found in…

Business Reality	Representation within the Model
Business Process	Dynamic Behavior: Use Case Diagram, Activity Diagram, OPN Static Structure: Class Diagram
Activity	Use Case in Use Case Diagram Activity in Activity Diagram Process in OPN Method in Class Diagram
Business Objects	Objects in OPN Objects/Classes in Class Diagram
Resources	Objects in OPN Objects/Classes in Class Diagram
Field of Work	Actor in Use Case Diagram Objects in OPN Objects/Classes/Roles in Class Diagram
Condition / Information	Conditions in Activity Diagram Pre- and Postconditions in OPN

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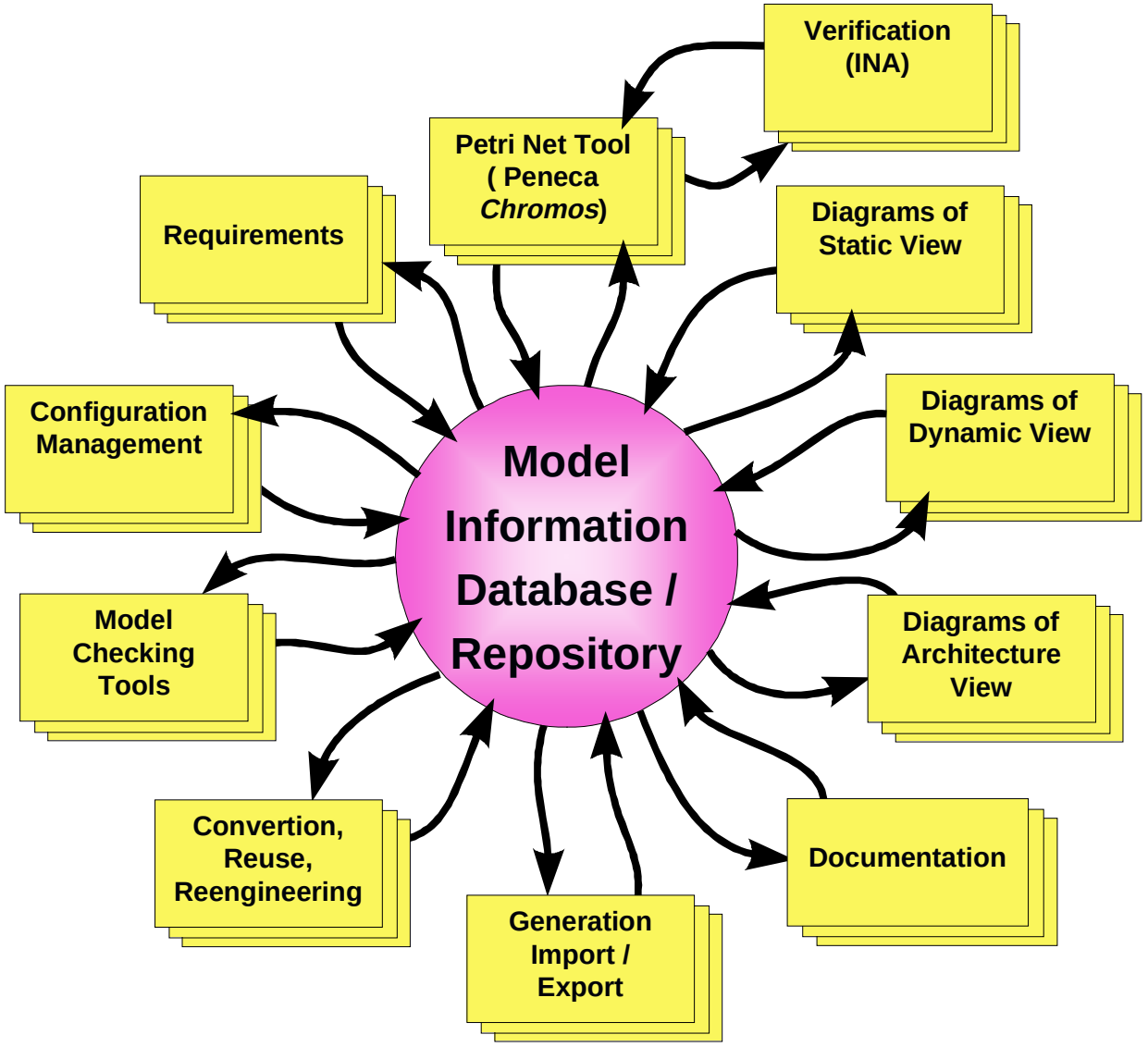
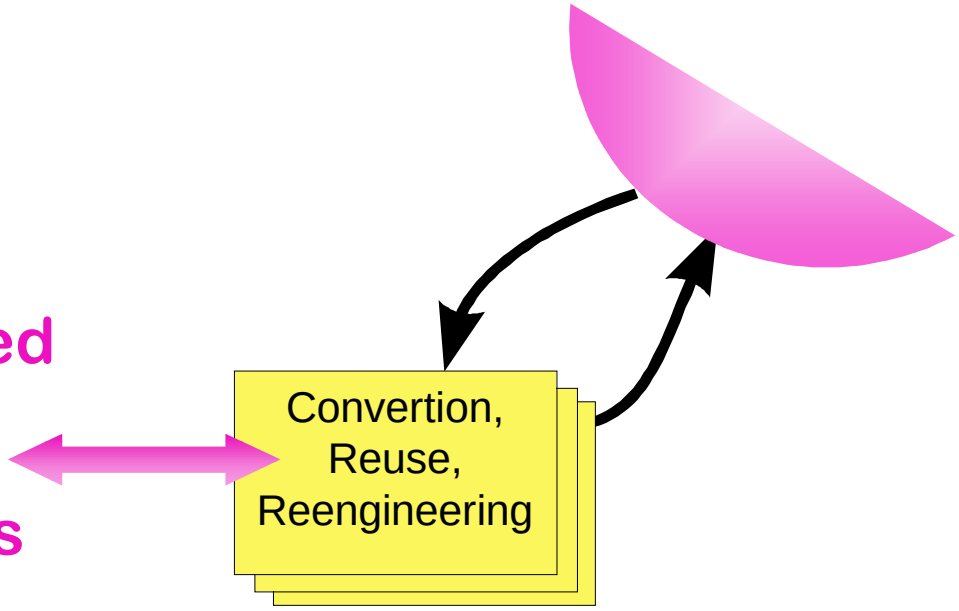
Tool support - *OTW®2*



Design Patterns in the *OTW®2*

Reuse is realized by

Design Patterns



- Design patterns for the creation of reference models or meta-models
- Patterns can be instantiated again and again
- *OTW®2* was the first tool supporting comfortable work with design patterns

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Summary

- UML as the first promising approach for standardization of object oriented analysis techniques
- OPN as an additional means of description for dynamic aspects of a system
- Meta Model for business process modeling to simplify the work with OPN
- Design Patterns for the work with reference models
- SEPP/OT for both: Organization of software projects and modeling of workflows

Further Work

- Processes „C“ (Code Generation) and „I“ (Implementation) also for workflow modeling
  - ⇒ executable code
- Timed OPN with additional time conditions for processes
  - ⇒ improving modeling power
- Tool-supported, automated transformation of OPN into High Level Petri Nets
  - ⇒ possibility of formal analysis techniques