41. Meta-CASE-Werkzeuge: MetaEdit+ von MetaCase

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Obligatory Reading

- MetaCase. Domain-Specif c Modeling With Metaedit+: 10 Times Faster Than UML. White paper. http://www.metacase.com/papers/Domain-specif c_modeling_10X_faster_than_UML.pdf
- MetaCase. Abc To Metacase Technology. http://www.metacase.com/papers/ABC_to_metaCASE.pdf
- A Comparison of ATL and Story-Driven Modeling (Fujaba-style GRS)
  - http://www.es.tu-darmstadt.de/f leadmin/download/publications/spatzina/PP_AGTIVE_2011.pdf

Literatur

- [Nill] C. Nill. Analysis and Design Modeling Using Metaphorical Modeling Entities. A Modeling Language for the Tools and Materials Approach. Diplomarbeit Technische Universität Dresden, 2006.
- http://www.metacase.com/support/45/manuals/index.html

41.1 Meta-CASE-Werkzeuge

Nutzung von Meta-CASE

- Ein **Meta-CASE-Werkzeug** ist eine metamodellgesteuerte Entwicklungsumgebung für den Entwurf von SEU und Softwarewerkzeugen
  - Metamodellsteuerung zur Herstellung einer individuell angepassten Werkzeug-Umgebung:
    - Generierung von Repositorien mit Frontend- und Backend-Tools für Austauschformate
    - Generierung von Editoren und Kompositionswerkzeugen für Artefakte
    - Kompositionssysteme zur Komposition von Werkzeugen
  - Modellierung von textuellen und graphischen Sprachen
  - Modellierung von domänenspezifischen Sprachen und ihren Werkzeugen (domain-specific languages, DSL)

Productivity by Meta-CASE

- Meta-CASE improve the productivity
  - of a sofware development team
  - of a team of domain engineers
  - Domain-specific methods are 5 to 10 times faster than using (UML-)notation
  - Reference: Domain-Specific Modeling: 10 Times Faster Than UML; Whitepaper MetaCase 2005; http://www.metacase.com/de/
- Meta-CASE are the most productive tools we know for the construction
  - of DSL
  - of tools
  - of composition systems
  - of IDE (SEU)
- You take part in a course which presents the most productive tools we know!

Weitere Beispiele zu Meta-CASE

- MetaEdit+ (commercial): Parametrisierbares CASE-Tool mit
  - Editor für rollenorientierte Metamodelle (MetaEdit+ rollenorientierte Metasprache)
  - Generator für die Erstellung der Methodenbeschreibung
  - Gute Anbindung an GUIs with Screen-Flow-Language
- AdoXX (commercial), BOC Vienna
- KOGGE, JKOGGE: Generator für grafische Entwurfsumgebungen
  - KOGGE basiert auf einer formalen Meta-Tool-Beschreibung und einem Interpreter (Prof. Ebert, Uni Koblenz)
    - http://www.uni-koblenz-landau.de/koblenz/fb4/institute/IST/AGEbert/MainResearch
- Eclipse Modeling Facility (EMOF):
  - Benutzt eine Teilmenge von MOF
- OpenArchitectureWare (EMOF): Moved to Eclipse
  - http://www.openarchitectureware.org/
- Netbeans: IDE based on MOF
- MOFLON: IDE based on MOF, with Storyboards (GRS), Logic (OCL) and TGG (GRS)
- Fujaba: with Storyboards (GRS)

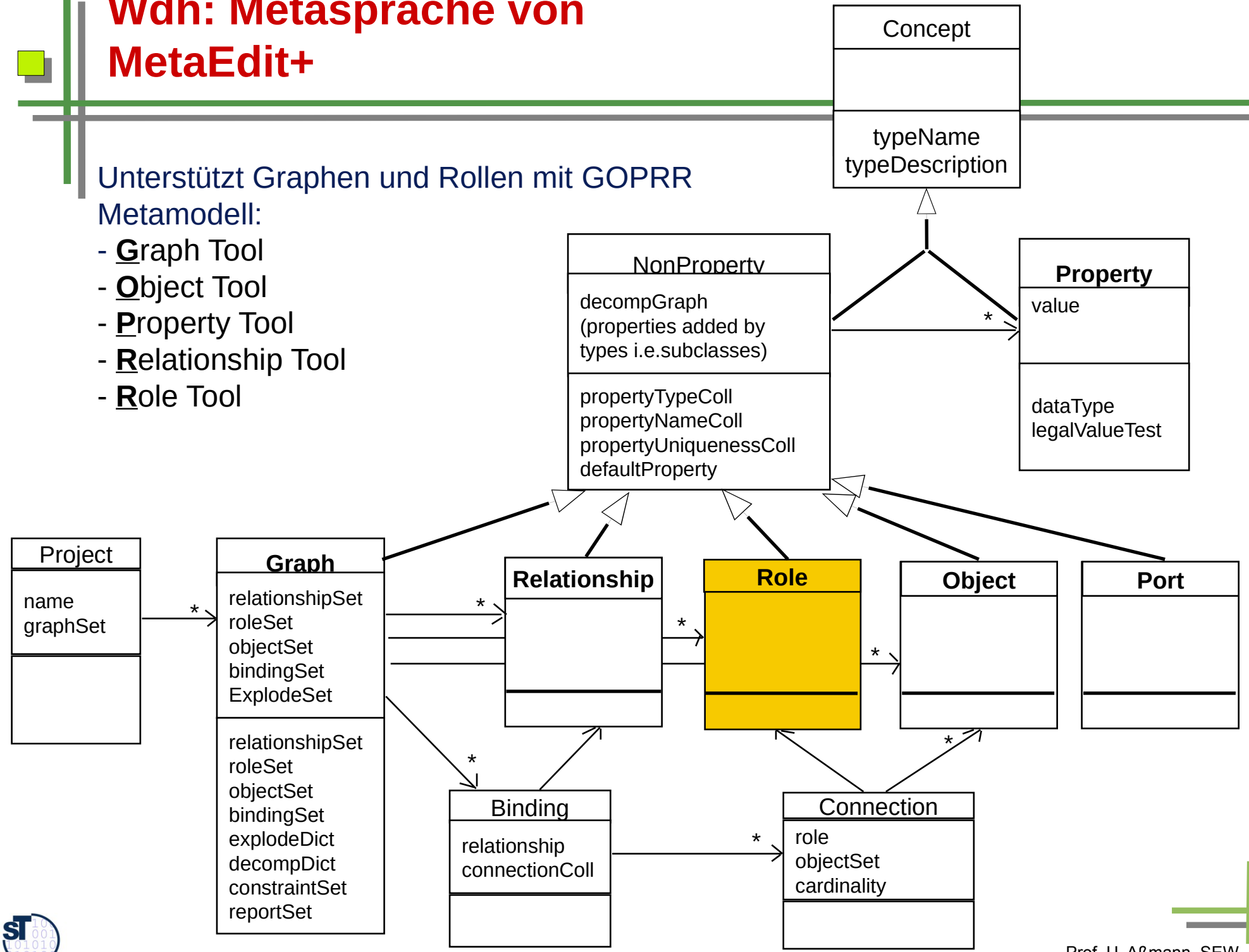
41.2 MetaEdit+ von MetaCase

- http://www.metacase.com/download/ Evaluation version
- http://www.metacase.com/cases/dsm_examples.html Many more DSL examples
- http://www.metacase.com/resources.html Articles and handbooks

Wdh: Metasprache von MetaEdit+

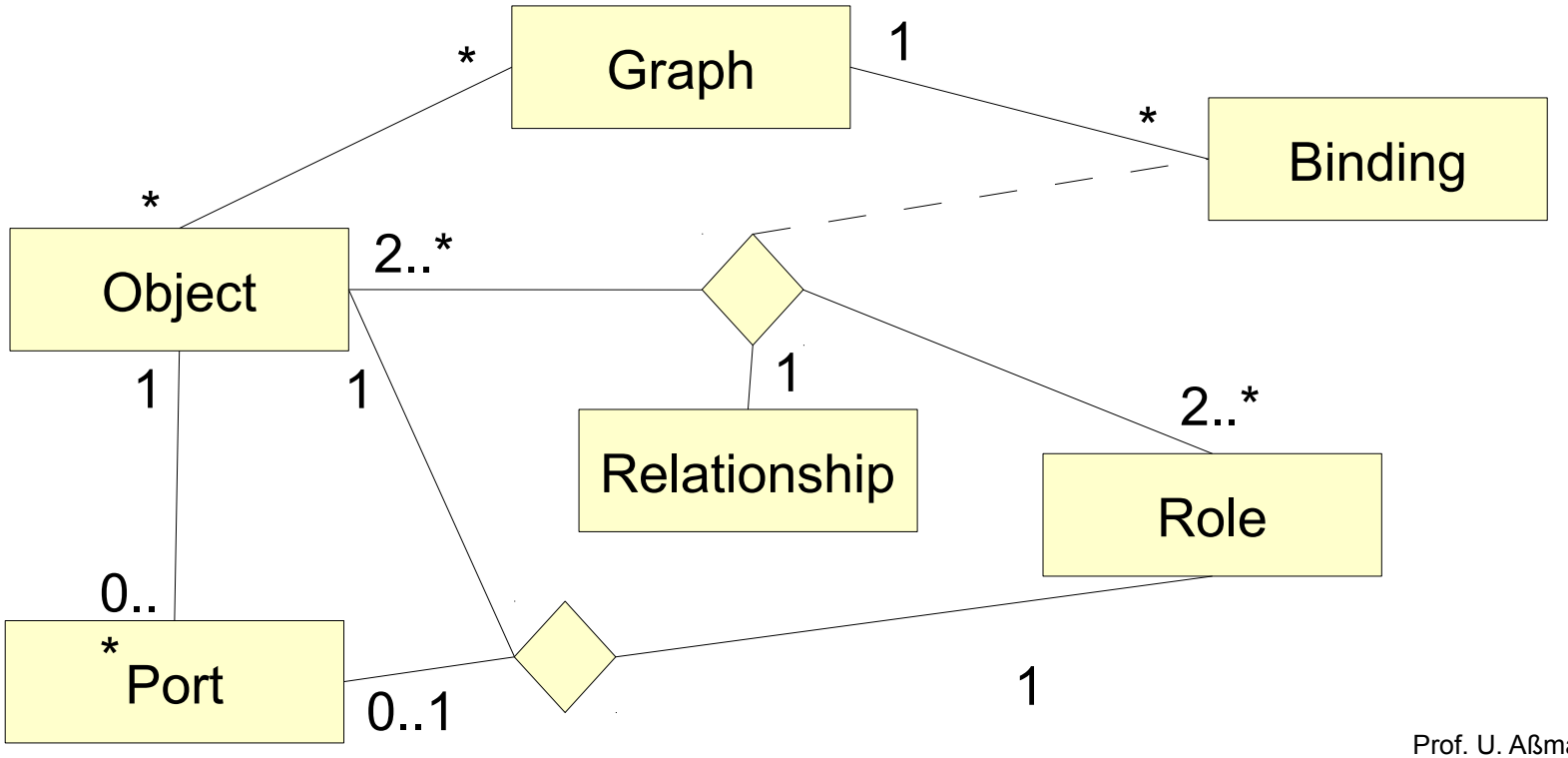
Unterstützt Graphen und Rollen mit GOPRR Metamodell:

- **G**raph Tool
- **O**bject Tool
- **P**roperty Tool
- **R**elationship Tool
- **R**ole Tool



Wdh: Graph Types in MetaEdit+

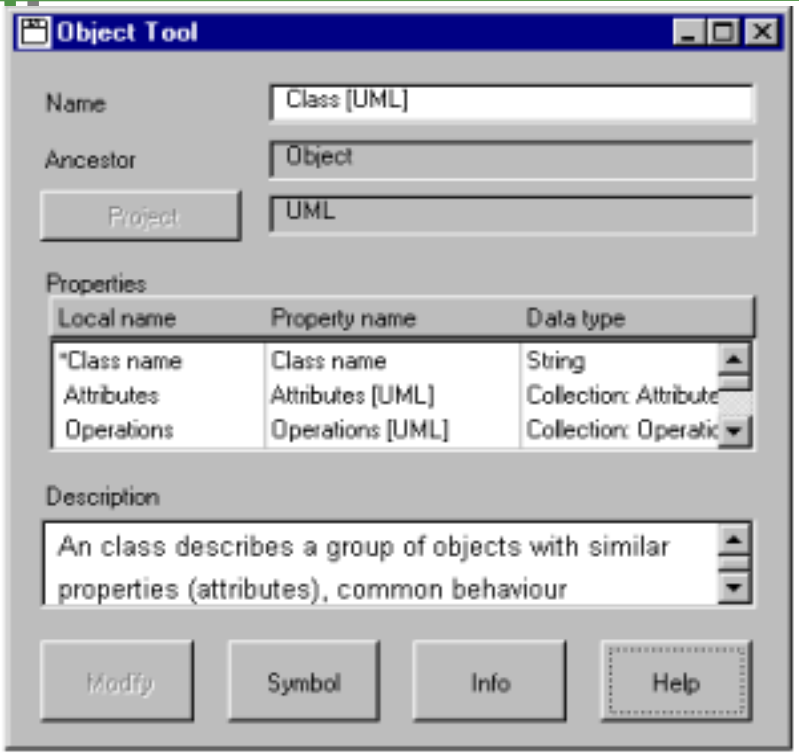
- A **graph type (diagram)** defines:
  - Objects
  - Roles
  - Relationships
  - Allowed Bindings between all entities:
    - a binding consists of a relationship with roles and playing objects

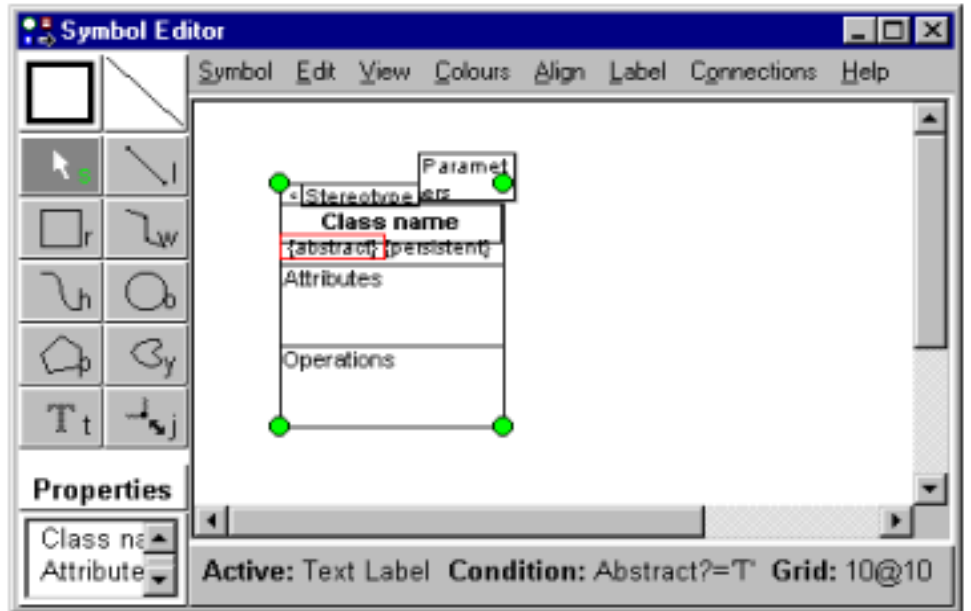


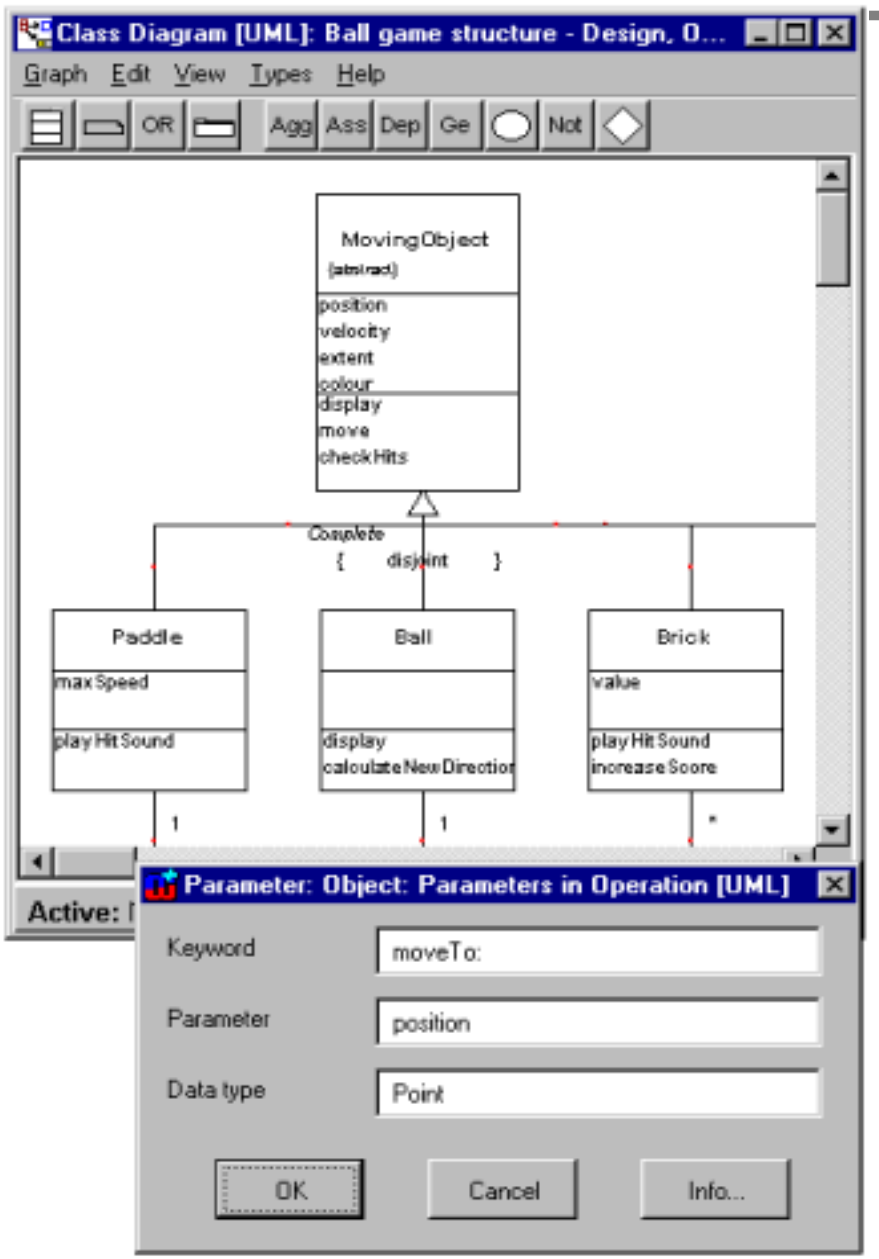
Erstellen eines eigenen CASE-Tools mit MetaEdit+

Entwurf der eigenen Methode

Benutzen der eigenen Methode







Quelle: http://www.metacase.com/mwb30index.html

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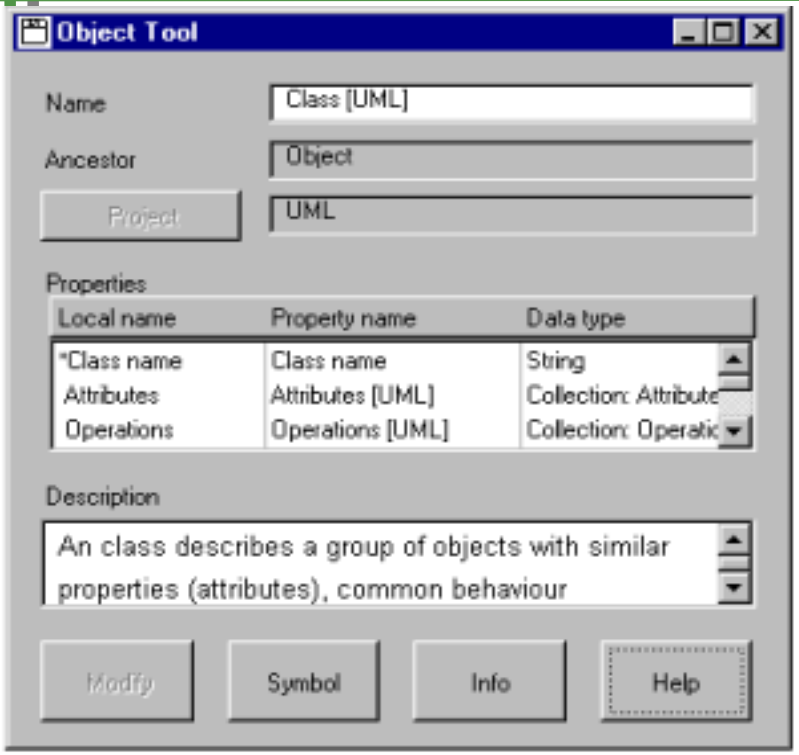

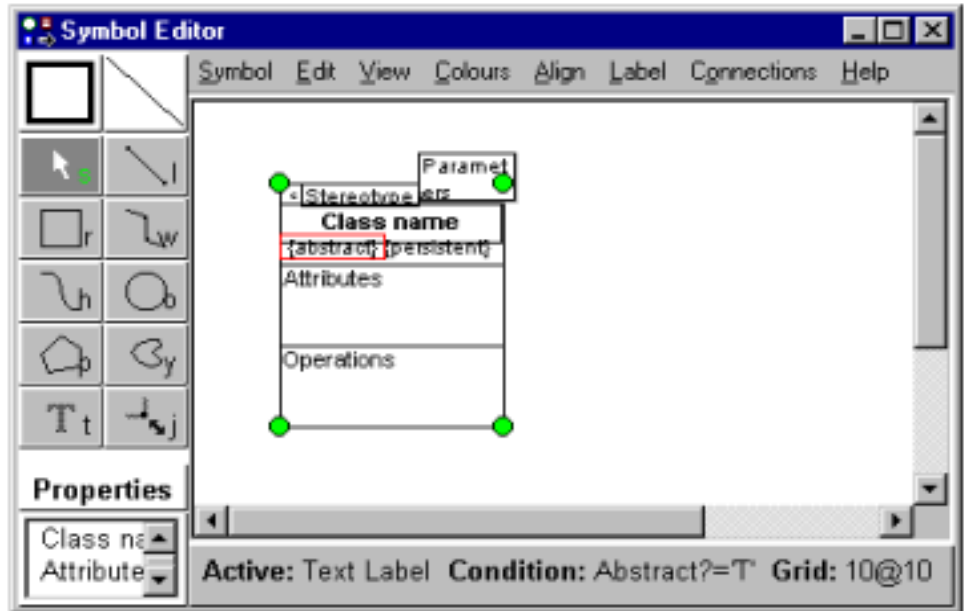

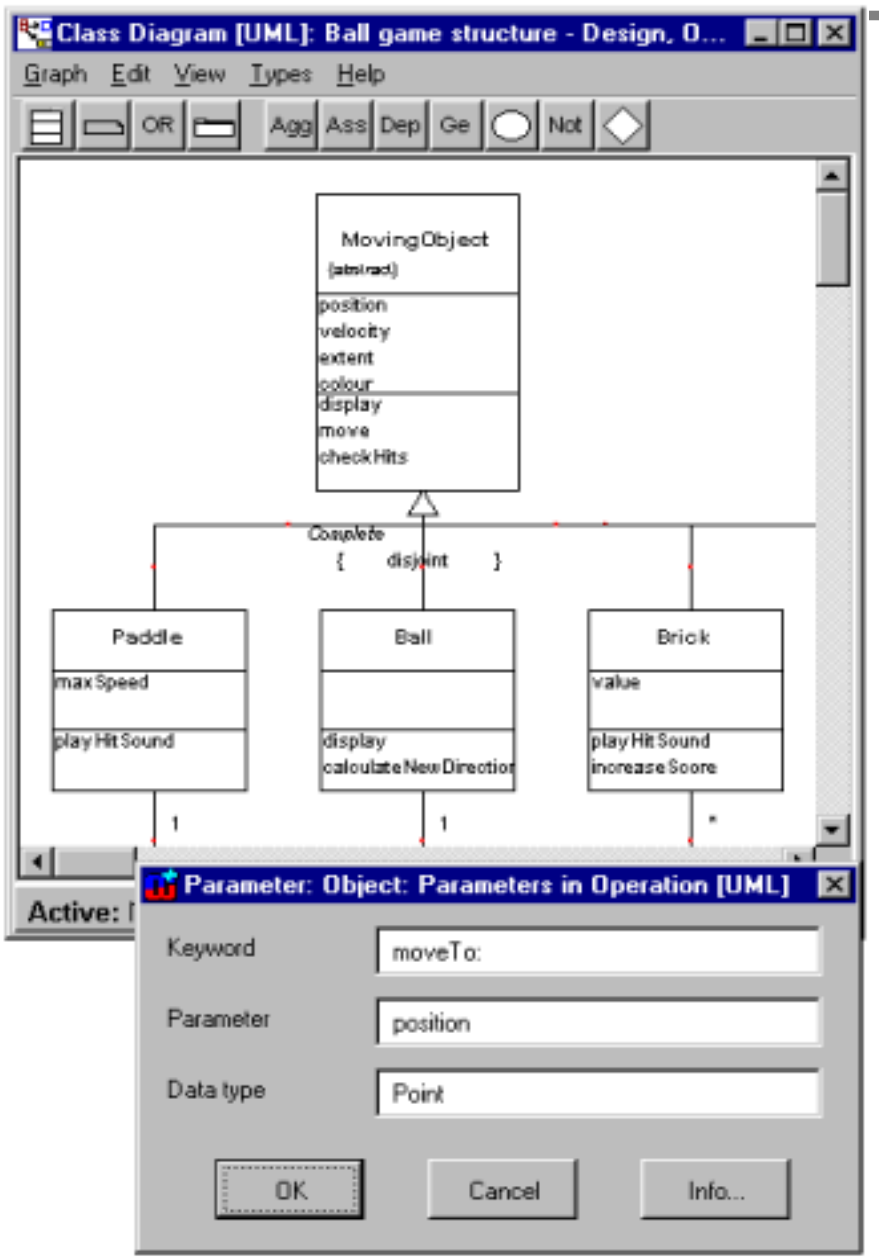

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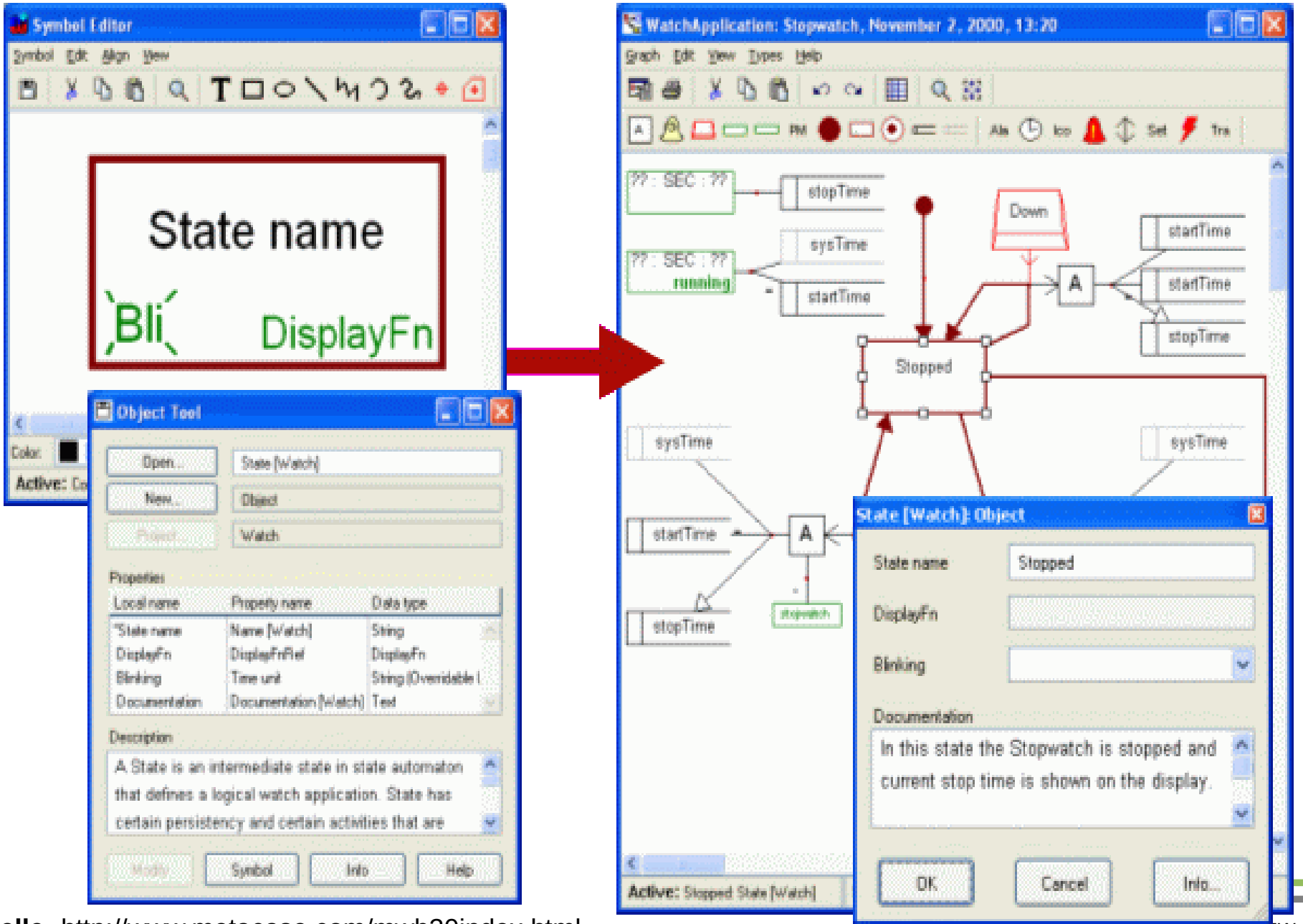
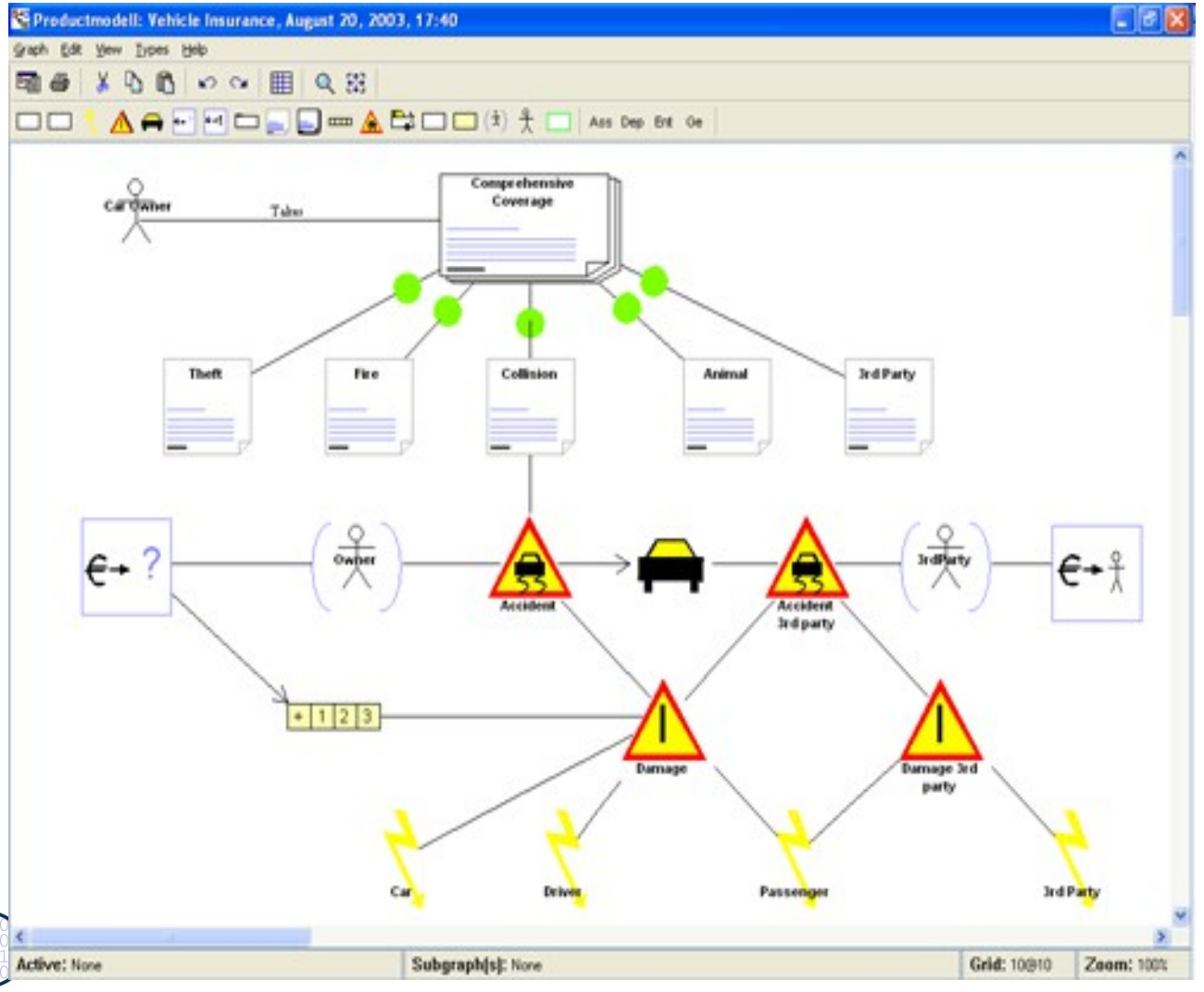
MetaEdit+ Workbench für ein State Diagram (STD)



Quelle: http://www.metacase.com/mwb30index.html

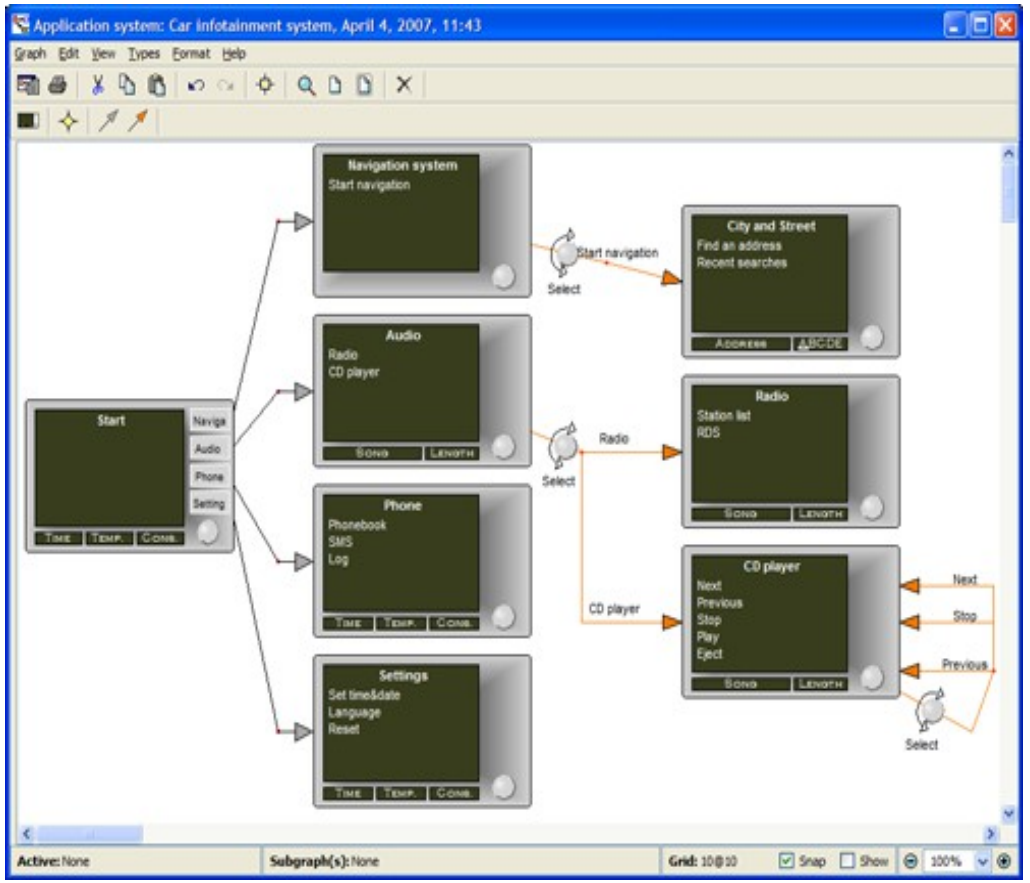
Insurance DSL

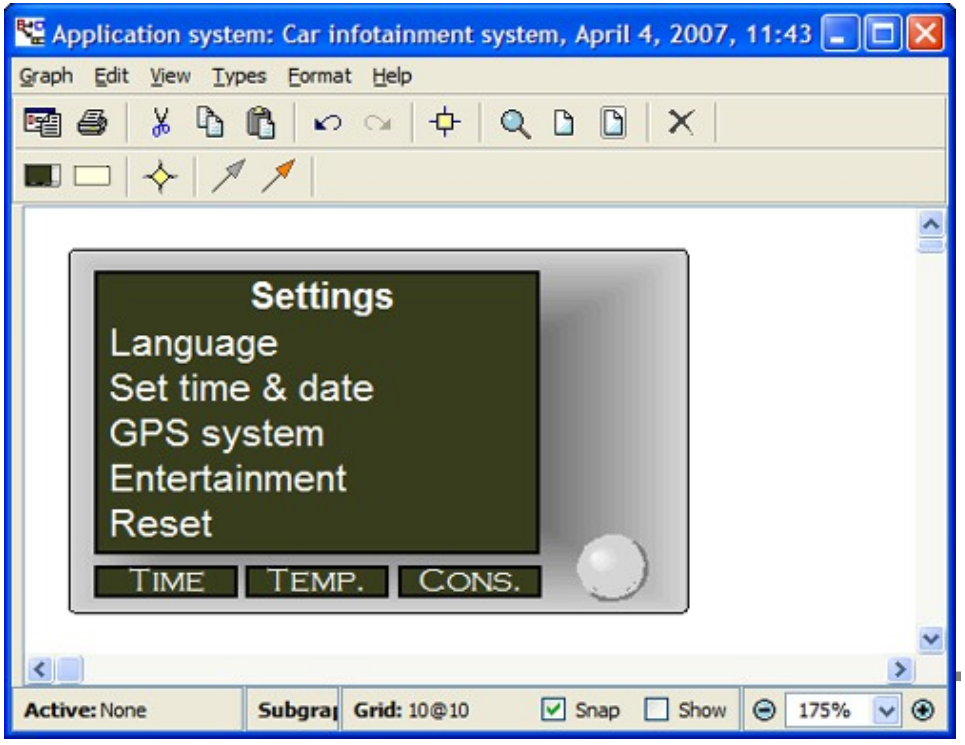
- For modeling of insurance products
- Generators produce the required insurance data and code for a J2EE website



Automotive Entertainment DSL

- Domain: car infotainment system and user interface elements
- Design of the logic and flow via connecting the modeling concepts between GUI and application concept metamodel editor





http://www.metacase.com/cases/autoinf

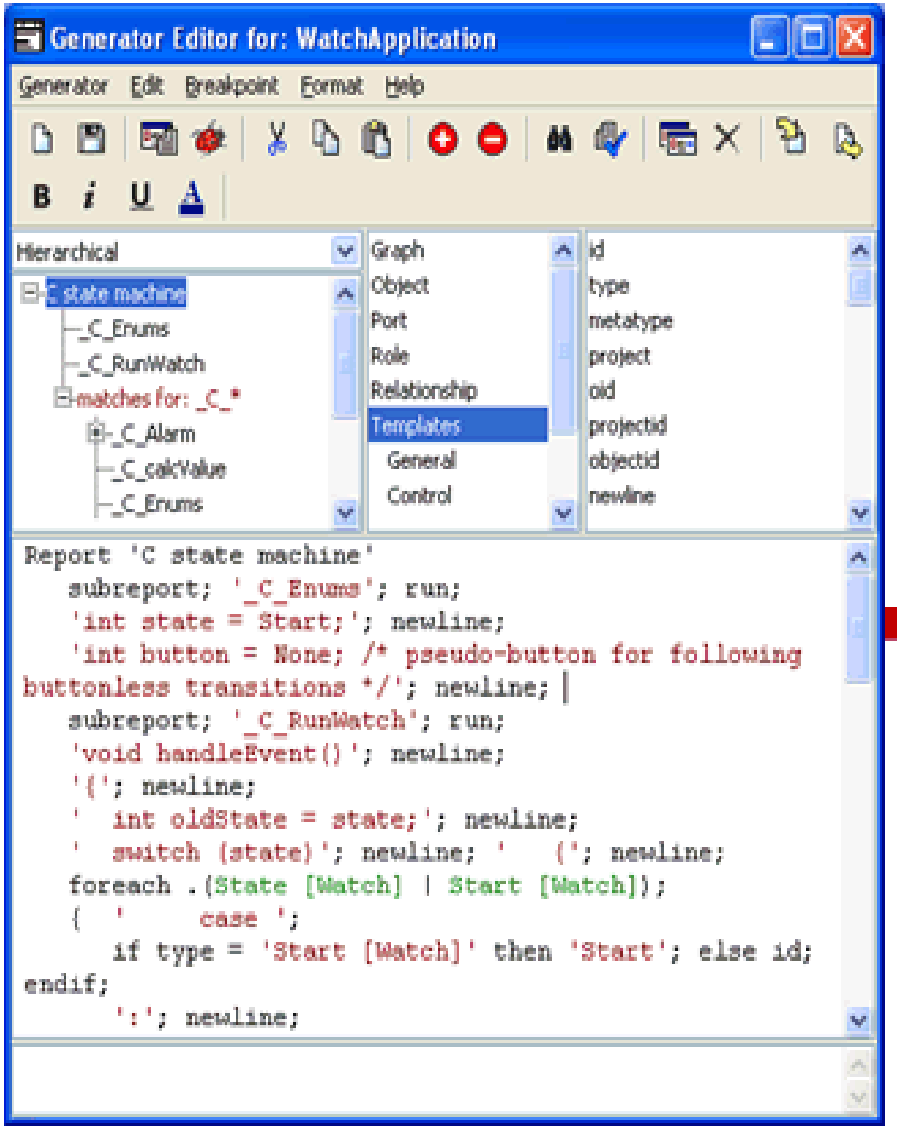
Werkzeuge in MetaEdit+

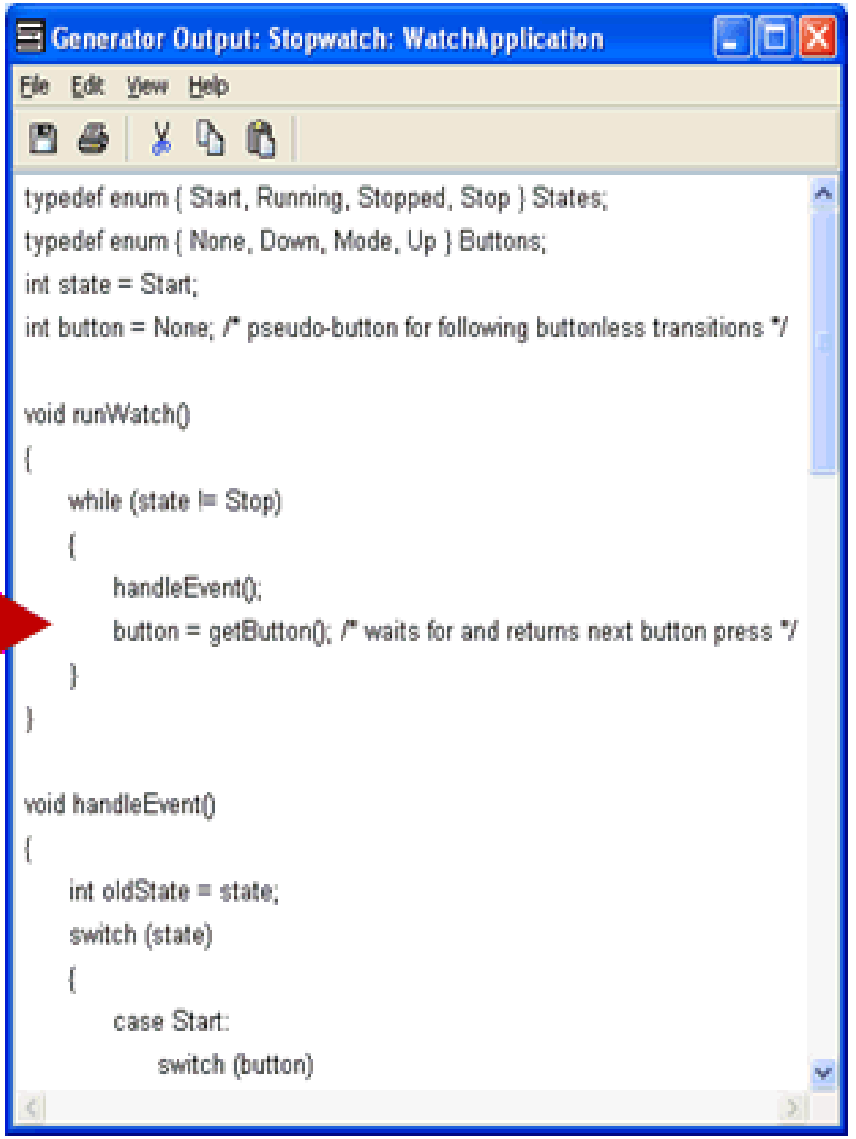
- Report Generator:
  - Skriptgesteuert, zur Erzeugung von Texten und Code
- API (API-Server):
  - MetaEdit+ ist in Smalltalk implementiert
  - Zugreifbar über Web Server (SOAP mit WSDL)

```
Report 'ExportToolUIModel'
'<?xml version="1.0" encoding="UTF-8"?>'newline;
'<model>'newline;
foreach .Graph {
  do :Graph {
    if type; = 'Tools UIs Model' then
       subreport; 'ToolUI_XML' run;
    else
       subreport; 'structureXML' run;
    endif
  }
}
'</model>'newline;
endreport
```

[Nill]

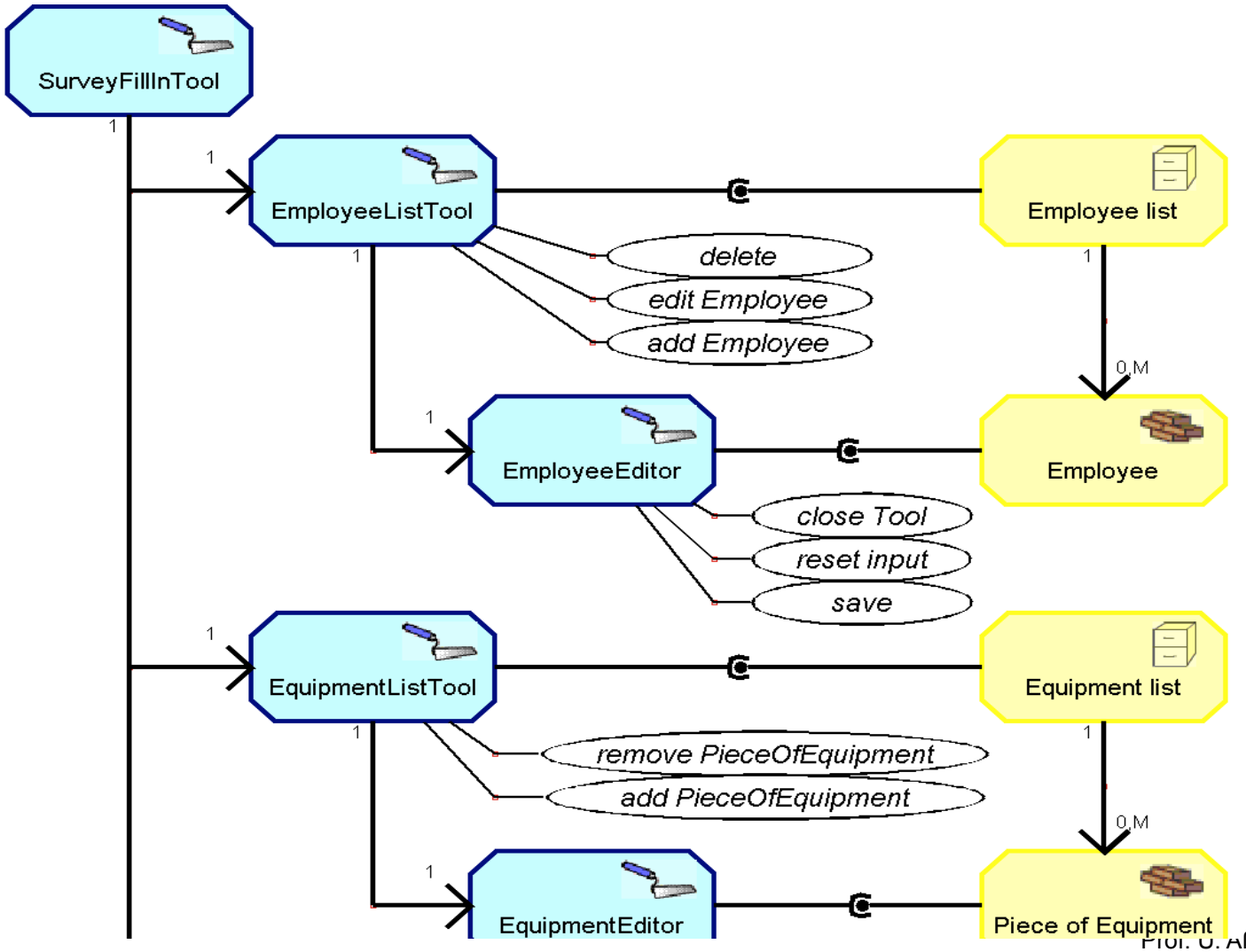
Editor for Scripts for Code Generation





Tool/Material DSL, Modeled in MetaEdit+

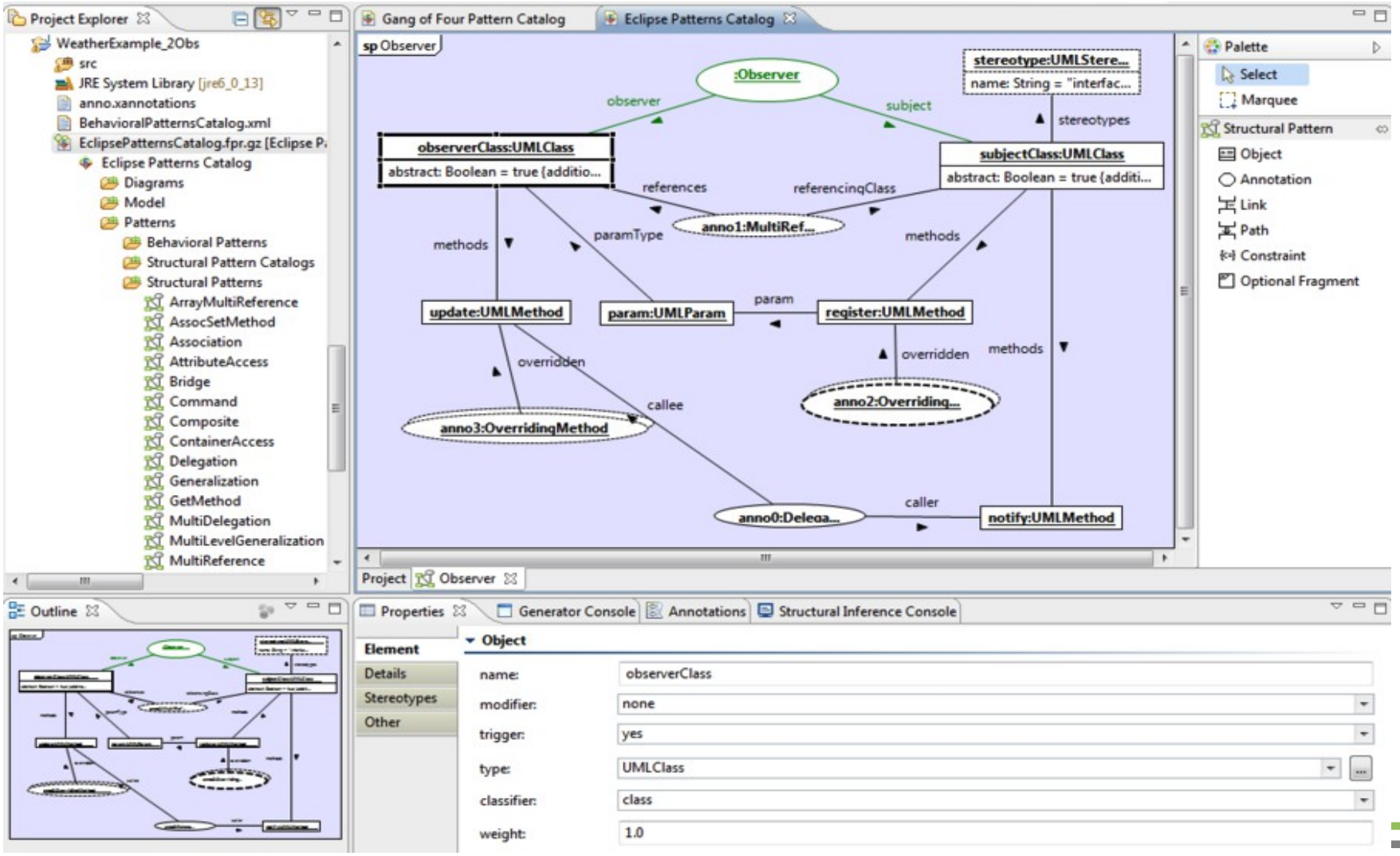
- [Nill] presented a DSL for Tools and Materials (TAM-DSL), modelled in in GOPRR with MetaEdit+
- Editor represents Tools and Materials graphically



41.2 Introduction to Fujaba

www.fujaba.de

- Fujaba is a MetaCASE-tool based on GRS
- Basic technology: graph pattern matching and rewriting



http://www.fujaba.de/typo3temp/pics/604c5c6c9e.png

The End