Modeling Software Systems @ Atenea
Universidad de Málaga

Manuel Wimmer

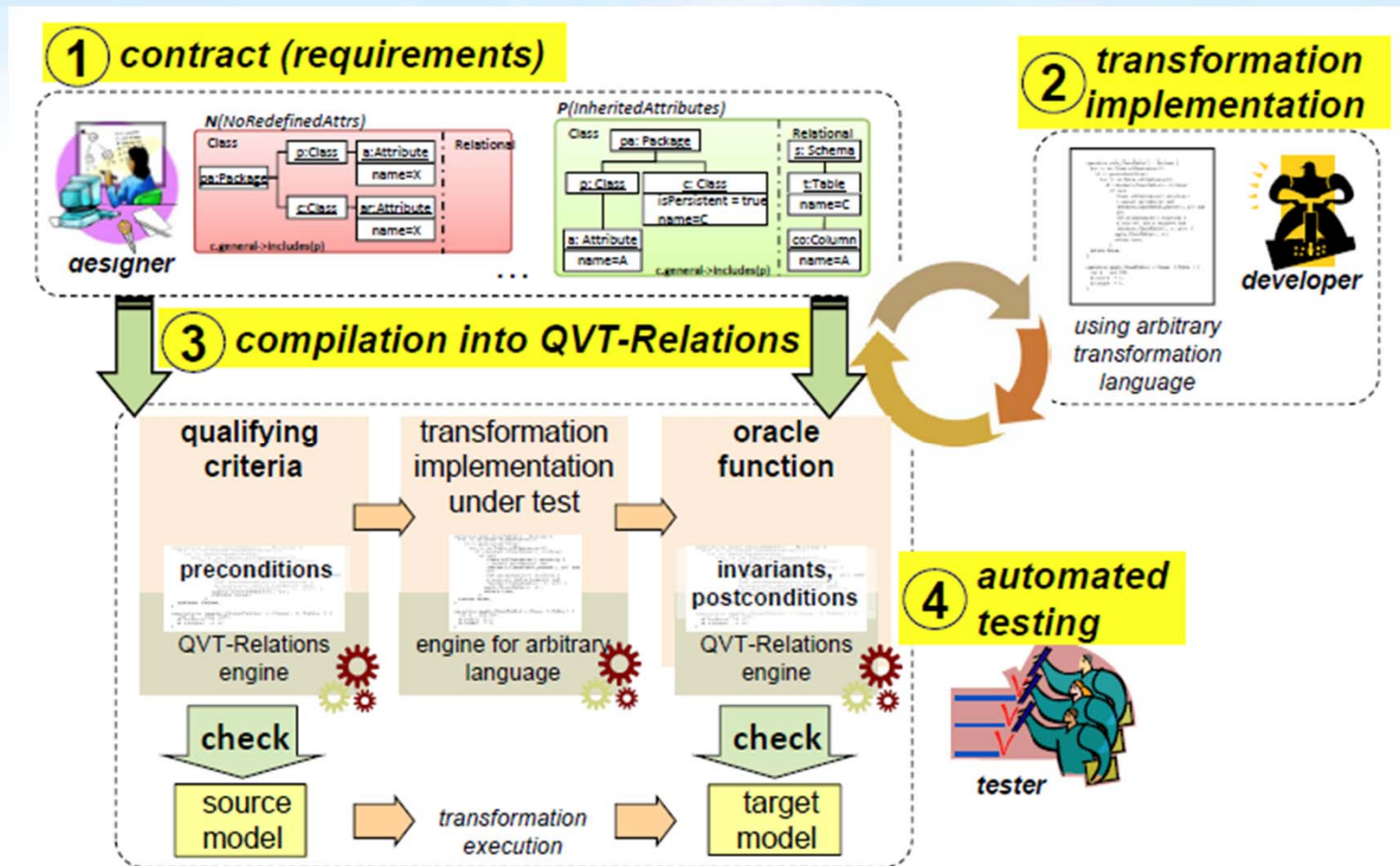2012 Bellairs CAMPaM Workshop

Who am I?

- 2011 – 2012: Research stay at Universidad de Málaga
  - Atenea Group: Antonio Vallecillo
  - Model-driven Evolution of Web Applications
  - Specification and Testing of Model Transformations
  - Modular development of Modeling Languages

- 2008 – current: Post-Doc at TU Vienna

- 2005 – 2008: PhD Student at TU Vienna
  - Supervisor: Gerti Kappel
  - Topic: Model-based Tool Integration

Atenea at a Glance

- **Atenea** is a group of researchers interested in **Modeling Software Systems**

- **Atenea** is part of the GISUM group, from the University of Málaga (Spain)

- **Atenea** conducts basic and applied research on modeling software systems, and on the provision of engineering tools to design, analyse, evaluate and implement distributed information systems
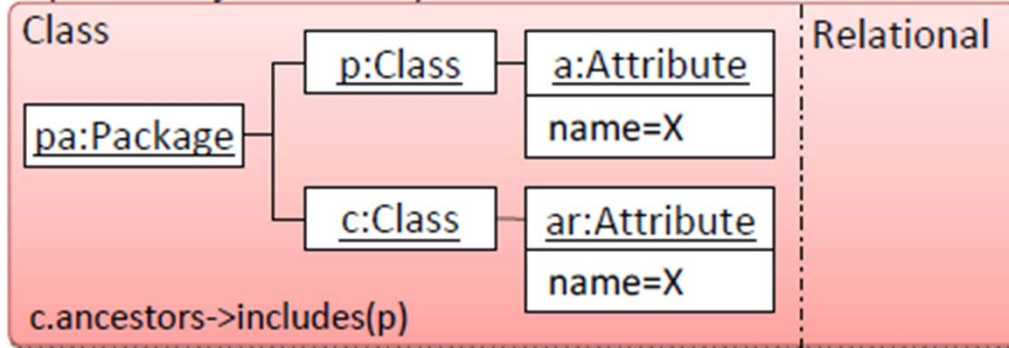
Model Transformation Contracts

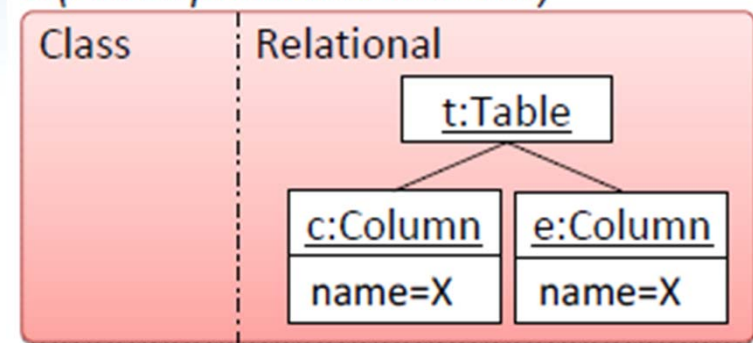Collaboration with Juan de Lara & Esther Guerra – using PaMoMo

Model Transformation Contracts

Specify Pre- and Post-Conditions as well as Relations between Source/Target Models
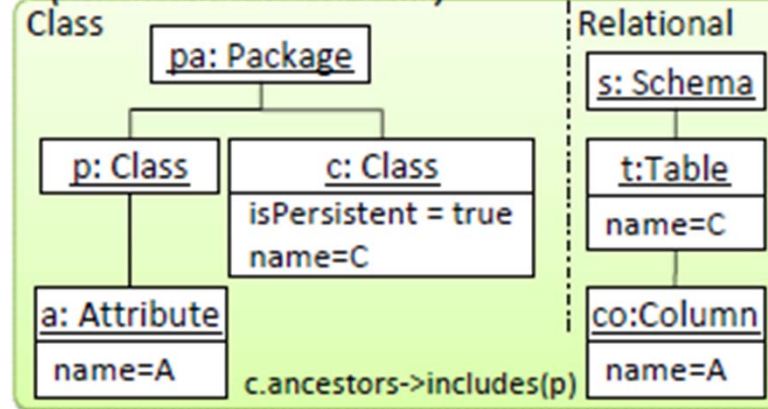

N(NoRedefinedAttrs)

Class / Relational

pa:Package — p:Class — a:Attribute (name=X)

pa:Package — c:Class — ar:Attribute (name=X)

c.ancestors->includes(p)

N(NoDuplicatedColumns)

Class / Relational

t:Table — c:Column (name=X), e:Column (name=X)

P(InheritedAttributes)

Class / Relational

pa: Package

p: Class, c: Class (isPersistent = true, name=C)

a: Attribute (name=A)

c.ancestors->includes(p)

s: Schema

t:Table (name=C)

co:Column (name=A)
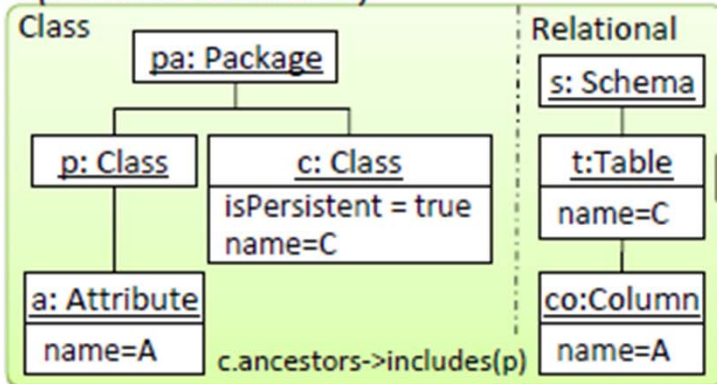
Model Transformation Contracts

Translate to QVT-R to check the constraints – using the ModelMorf tool


```
P(InheritedAttributes)

Class
        pa: Package
                                    Relational
                                       s: Schema
    p: Class        c: Class
                    isPersistent = true    t:Table
                    name=C                 name=C

a: Attribute
name=A      c.ancestors->includes(p)       co:Column
                                           name=A
```
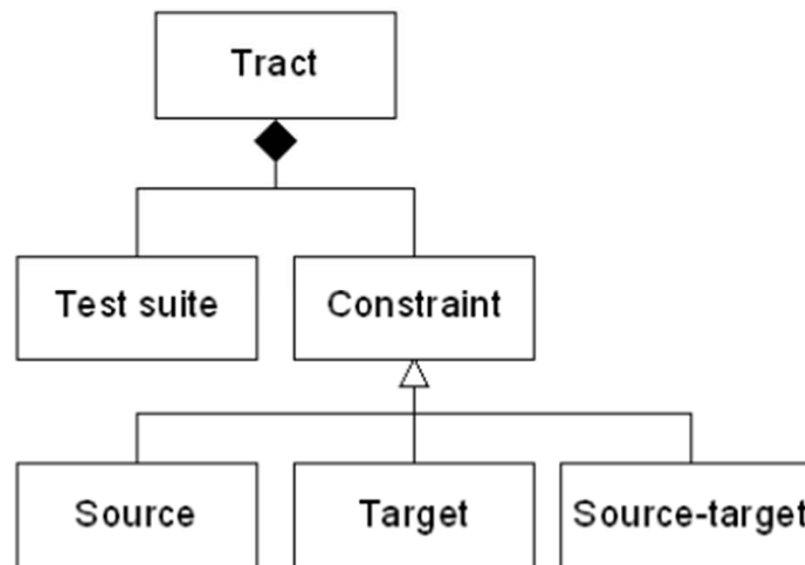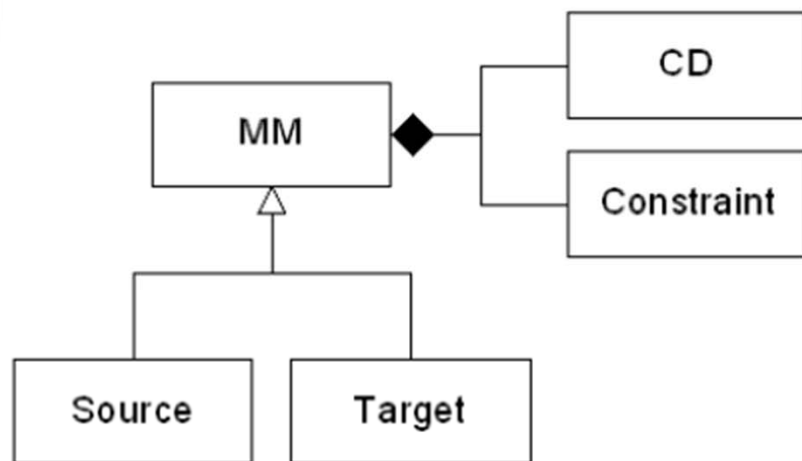
```
transformation checkInv(Source:uml; Target:rel){
 top relation InheritedAttributes {
    A, C : String;
    domain Source pa : Package {
        classes = p:Class {
            attributes = a:Attribute { name = A }
        },
        classes = c:Class {
          isPersistent = true,
          name = C
        }
    };
    checkonly domain Target s : Schema {
        tables = t:Table {
            name = C,
            columns = co:Column { name = A }
        }
    };
    when { p<>c; c.ancestors->includes(p);}
 }
}
```
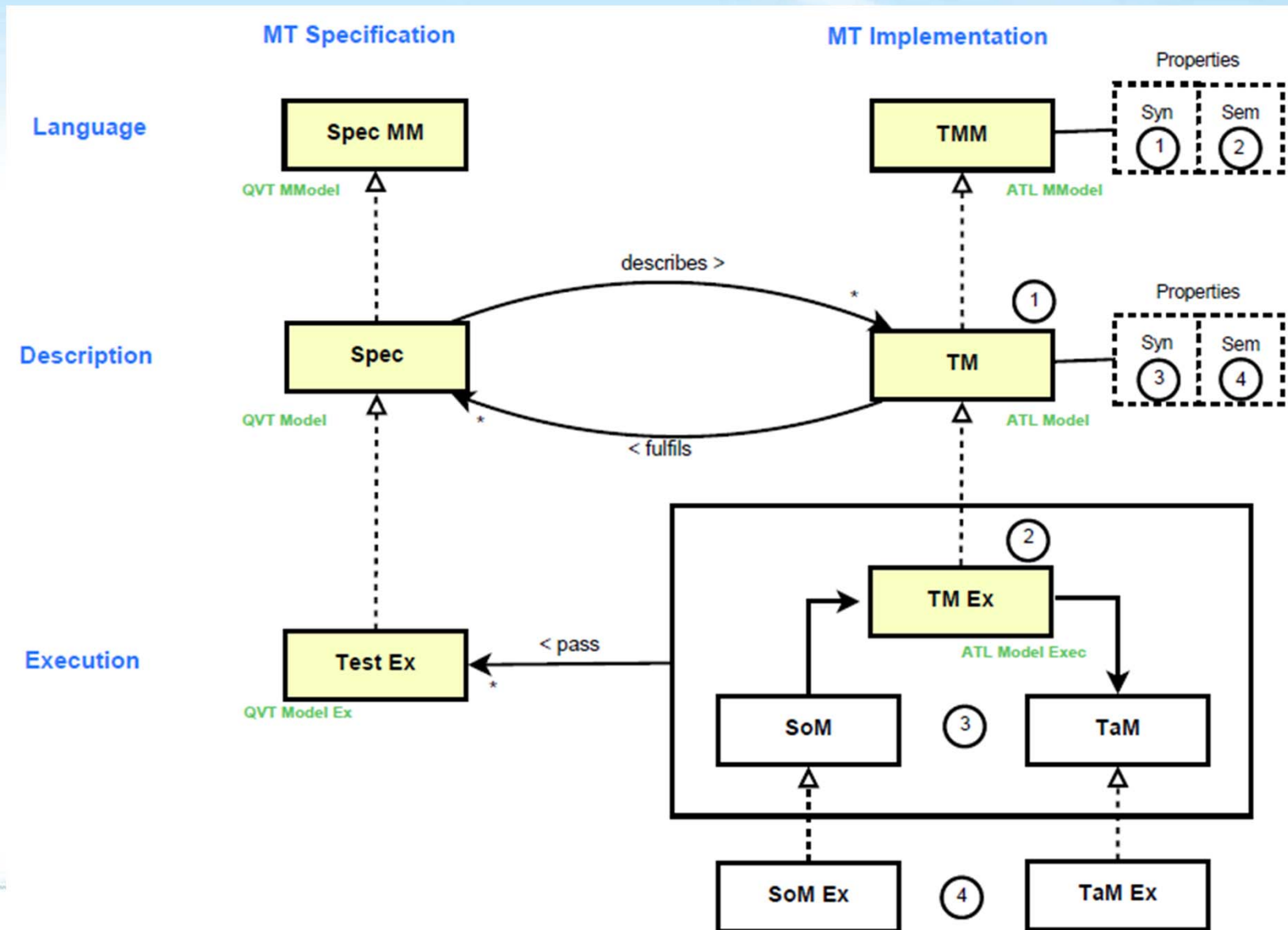
Model Transformation Contracts

Collaboration with Antonio Vallecillo and Martin Gogolla – using OCL


```
context Member
inv NoIsolatedMembers:
  Member.allInstances->forAll (m |
    m.familyFather->size() + m.familyMother->size() +
    m.familySon->size() + m.familyDaugther->size() > 0)
```

Model Transformation Properties

Expectations?

- Find people who are interested in
  - Quality of model transformations ((non-)functional)
  - Systematic development of DSMLs (including syntax and semantics, using reduce, reuse, combine operators)
  - Model Management (generic and specific)
    - Co-evolution
    - Diffing
    - Merging
    - ...

- Criteria for success
  - Learn from people from other areas
  - Start working on joint paper(s)
  - Find out potential for long-term collaborations

Atenea
Modeling Software Systems

- Dr. Antonio Vallecillo
- Dr. Francisco Durán
- Dr. Manuel Wimmer (visiting)
- Dr. José Raúl Romero
- Dr. Manuel F. Bertoa
- Dr. Manuel Roldán
- Javier Troya (PhD st)
- Nathalie Moreno (PhD st)
- Loli Burgueño (PhD st)