# Model Repair and Transformation with **Echo**

Nuno Macedo, Tiago Guimarães, Alcino Cunha
HASLab, INESC TEC & Universidade do Minho
fatbit@di.uminho.pt

## Model-driven Engineering

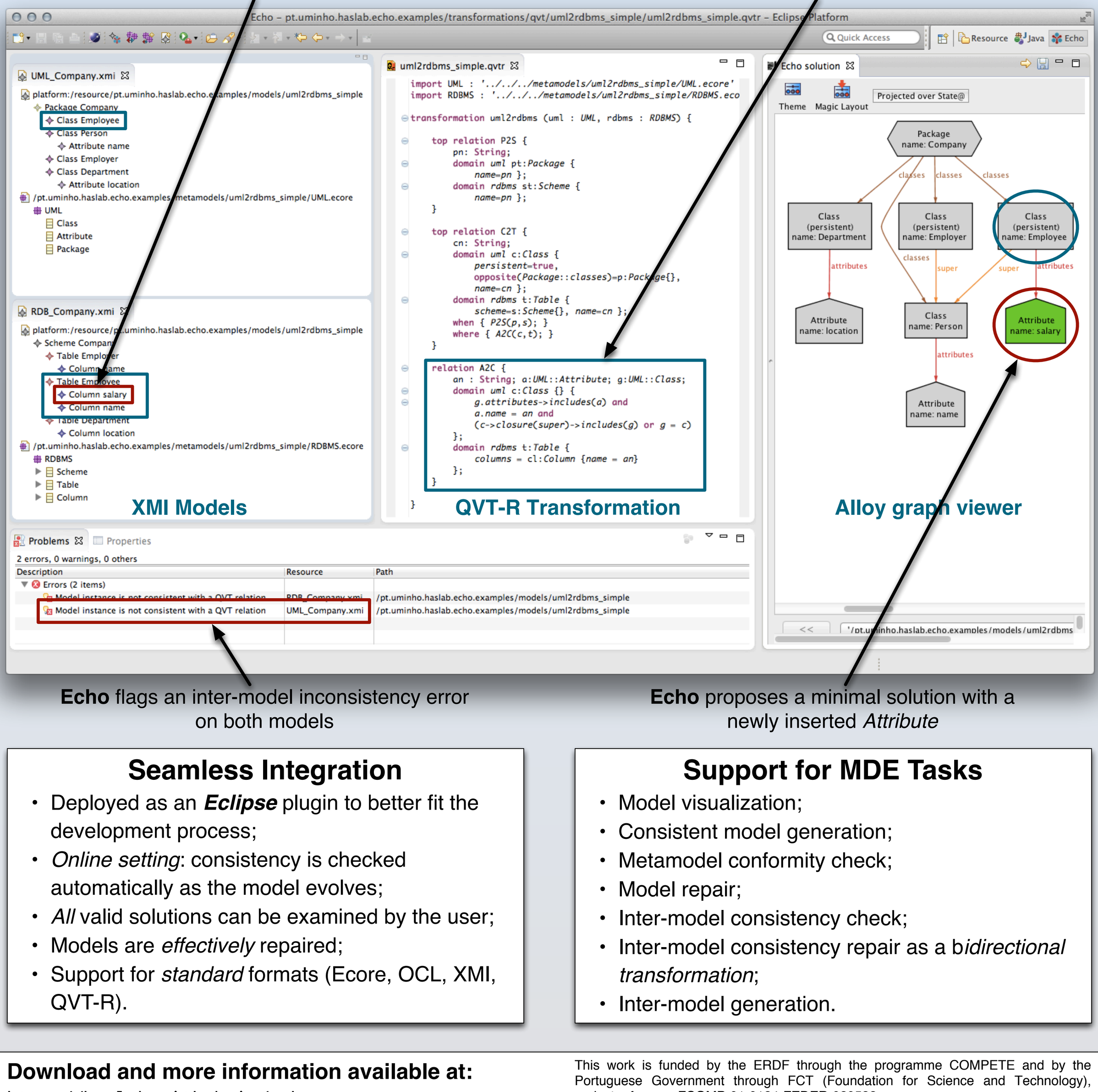
- In the MDE process *inconsistencies* will indubitably be introduced;
- Models become inconsistent with their *metamodels* and with other *coexisting* models;
- ***Echo*** has been developed to promote the correct evolution of models;
- Able to both *find* and *repair* inconsistencies.

## Built for Correctness

- Built over the **Alloy** *model finder*;
- Repairs are guaranteed to be *correct*;
- Supports *intra*- (metamodel) and *inter*- (QVT-R) model constraints;
- Updates are always *minimal*;
- The model distance metric can be *parametrized* by the user.

A new table *Column* is inserted in the database scheme

QVT-R consistency relation forces *Columns* to have matching *Attributes*




**Echo** flags an inter-model inconsistency error on both models

**Echo** proposes a minimal solution with a newly inserted *Attribute*

## Seamless Integration

- Deployed as an ***Eclipse*** plugin to better fit the development process;
- *Online setting*: consistency is checked automatically as the model evolves;
- *All* valid solutions can be examined by the user;
- Models are *effectively* repaired;
- Support for *standard* formats (Ecore, OCL, XMI, QVT-R).

## Support for MDE Tasks

- Model visualization;
- Consistent model generation;
- Metamodel conformity check;
- Model repair;
- Inter-model consistency check;
- Inter-model consistency repair as a b*idirectional transformation*;
- Inter-model generation.

## Download and more information available at:

http://haslab.github.io/echo

**FATBIT Project**
Foundations, Applications and Tools for Bidirectional Transformation
http://fatbit.di.uminho.pt

HASLab HIGH-ASSURANCE SOFTWARE LABORATORY — Universidade do Minho

This work is funded by the ERDF through the programme COMPETE and by the Portuguese Government through FCT (Foundation for Science and Technology), project reference FCOMP-01-0124-FEDER-020532.
The first author is also sponsored by FCT grant SFRH/BD/69585/2010.

COMPETE — PROGRAMA OPERACIONAL FACTORES DE COMPETITIVIDADE
QUADRO DE REFERÊNCIA ESTRATÉGICO NACIONAL PORTUGAL 2007.2013
UNIÃO EUROPEIA — Fundo Europeu de Desenvolvimento Regional
FCT — Fundação para a Ciência e a Tecnologia — MINISTÉRIO DA CIÊNCIA, TECNOLOGIA E ENSINO SUPERIOR