

Schema and Data Mapping and Transformation

PhD Student: Giorgio Gianforme

Supervisor: Prof. Paolo Atzeni

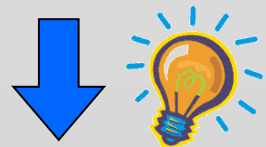
Why? Humans need models to represent every kind of knowledge. To share knowledge humans have to unify models

What? Given two data models $M1$ and $M2$ (like ER, Relational, Object Oriented, Object Relational, XSD, ...), and a schema $S1$ of $M1$ (the *source* schema and model), we generate a schema $S2$ of $M2$ (the *target* schema and model), corresponding to $S1$ and, for each database $D1$ over $S1$, we generate an equivalent database $D2$ over $S2$

How? We use a framework that allows the definition of *any* possible model and the definition of translations from a model to another

Metamodel

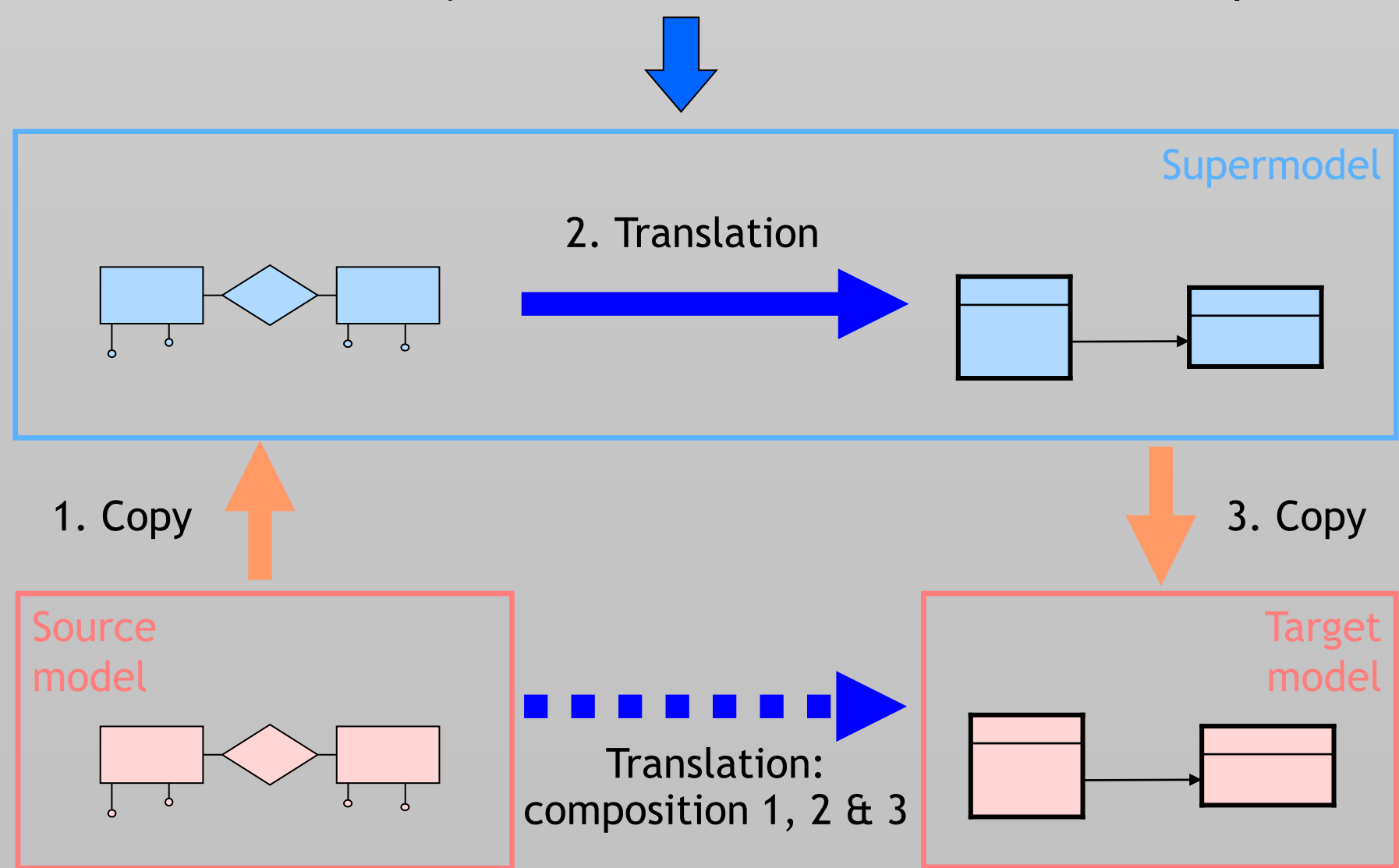
The constructs in the various models are rather similar and can be classified into a few categories



We can fix a set of metaconstructs and define models in terms of the metaconstructs they use

Supermodel

A model that includes all the metaconstructs
Each model is subsumed by the supermodel
Each schema for any model is also a schema for the supermodel

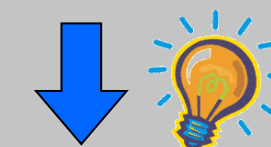


	model	Model descriptions (mM)	Supermodel description (mSM)
	schema	Model schemas (M)	Supermodel schemas (SM)
	data	Model instances (i-M)	Supermodel instances (i-SM)
		model specific	model generic
			model independence

Translations

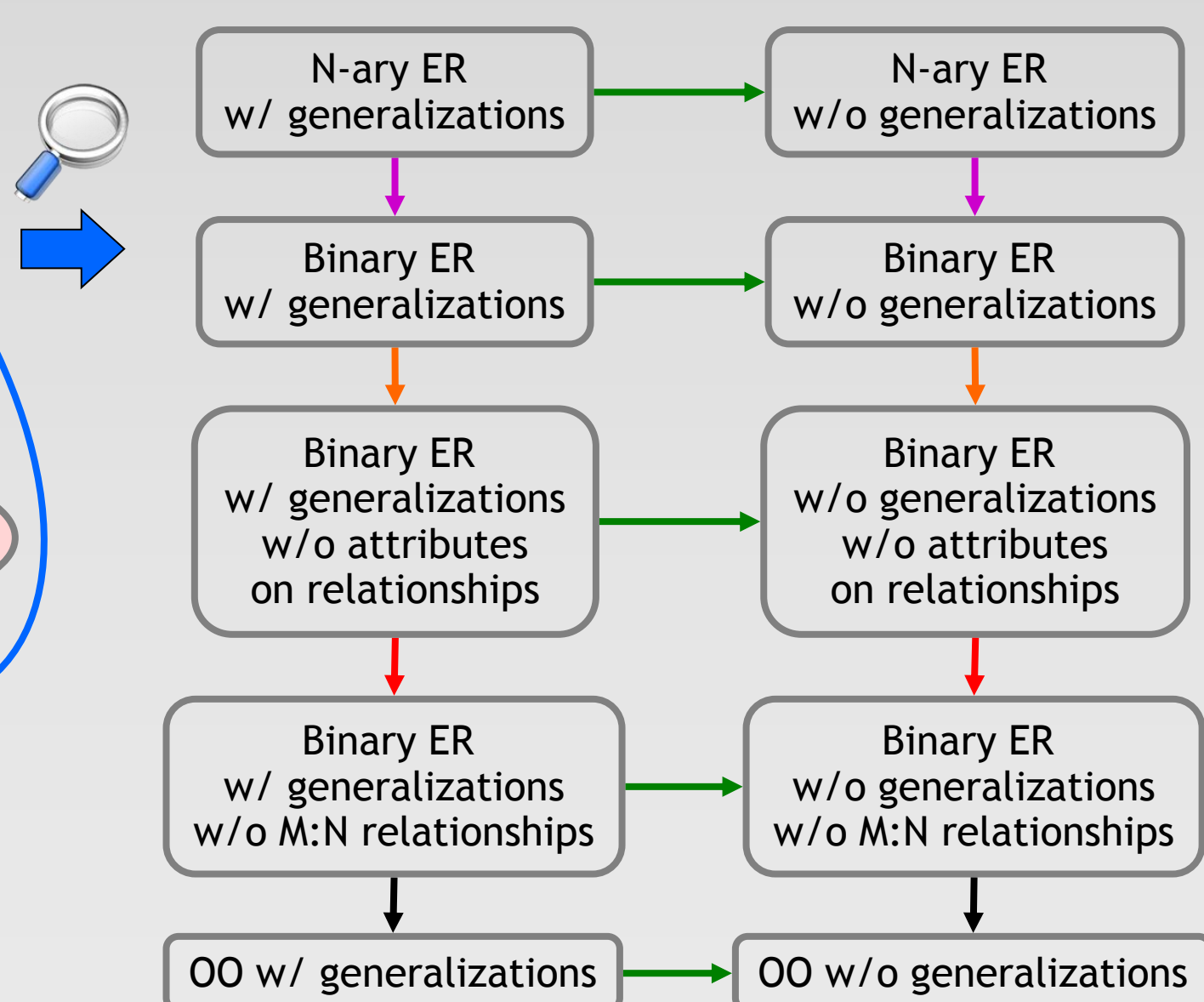
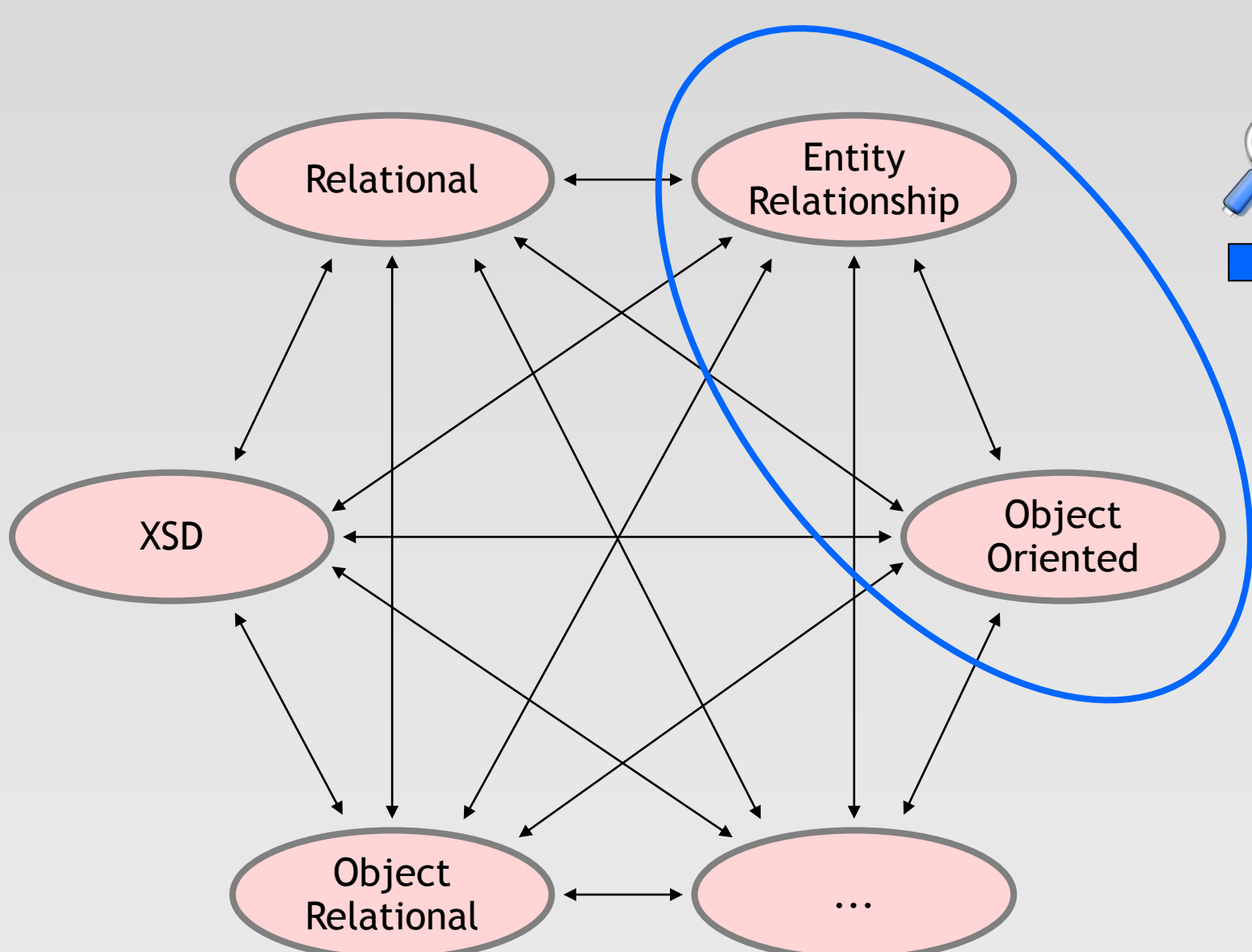
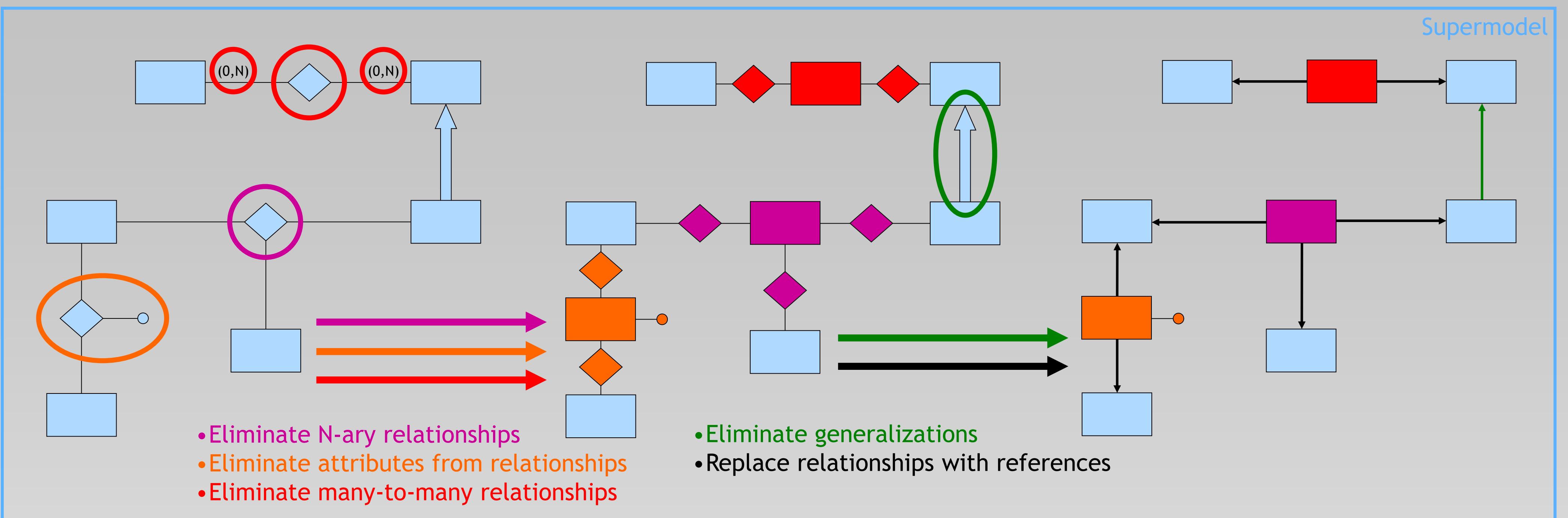
Translations can be defined on metaconstructs
Each translation from the supermodel SM to a target model M is also a translation from any other model to M

Given n models, we need n translations, not n^2 but we still have too much models



Elementary translation steps to be combined
Each translation step handles a supermodel construct (or a feature thereof) "to be eliminated" or "transformed"
A translation is the concatenation of elementary translation steps
Basic translations are written in a variant of Datalog, with OID invention

Example: A Complex Translation from ER to OO



Current Issues

- ✓ Enrichment of meta Super Model
- ✓ Accuracy of represented models
- ✓ Compact representation of models and rules to reason on data models
- ✓ Completely automatic way to select basic translations composing a complex translation
- ✓ Extension of meta Super Model with semantic