Globalizing Modeling Languages: Issues and Challenges

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Q1: What is your definition of “Globalization of Modeling Languages”

The definition given in the original GEMOC paper [1]:
“The use of multiple languages to support coordinated development of diverse systems aspects”

However, I see it is more adequate to define what Multi-Viewpoint Modeling is/should be about:
“The combination of multiple languages to support coordinated specification, analysis and development of diverse systems aspects”

Thus, in my view, “Globalizing a Modeling Language” means “Making a Modeling Language amenable for integration into a (standard) Multi-Viewpoint Modeling environment”

Notes:
- Globalized MLs need to be combinable and integrable
- Interfaces at different levels should be defined
- Standardization should play a key role here
Q2: What are we doing in this area?

**RM-ODP**
- A mature framework for the specification of systems, using viewpoints (ISO & ITU-T standard!)
- Five viewpoints and their Viewpoint Languages (VPL)
- Explicit correspondences between the VPL
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例：診療所ODPシステム仕様
Correspondence Metamodel (UML4ODP)

FIGURE 7.2: The elements of a correspondence specification.
Establishing correspondences
Q2: What are we doing in this area?

- Working on RM-ODP
  - Editor of the new version of the standards (2010-13)
  - Editor of ISO 19793 “Use of UML for ODP systems specification” (2009, 2013)
  - Book on ODP [2]
  - Research on the specification of correspondences [3]
  - A tool for ODP systems specifications using UML4ODP (the official MagicDraw plugin for ODP) [4]
    - Editors for the 5 viewpoints and for the correspondences
    - Model validators
    - Simulations supported for the Computational Viewpoint

- Working on the combination of DSMLs
  - How to combine DSMLs, issues and challenges [5]


Q3: Top 3 research challenges

- **Combination/Integration/Unification of languages**
  - Has to be at the same level of abstraction!
  - Needs establishing correspondences between them (at all levels: Abstract Syntax, Concrete Syntax and Semantics)
  - Needs to deal with heterogeneous (and not always combinable, see [5]) semantics
  - Correspondences between metamodels, and between models

- **Specification/Visualization of correspondences**
  - In an efficient, correct, usable and maintainable manner
  - Both implicit and explicit (see [3] and [4])

- **Reasoning about the information expressed across the different models**
  - Emergent properties!

**ALL MUST BE TOOL-SUPPORTED (otherwise useless!)**