

# Ontology, Model, and Specification Integration and Interoperability (OntoOp)

OMG Analysis & Design TF

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# Scope of presentation

- Motivation and goals for OntoOp RFP
- What changed?
- Relationship to SIMF

# The Interoperability Challenge

Truism: Ontologies are no silver bullets

Two ontologies (models, specifications) may be incompatible because

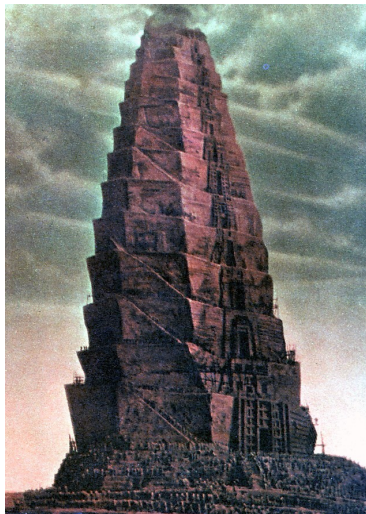
- Incompatible content
- Different languages

# Diversity of KR Languages

- OWL, RDF, OBO
- UML class diagrams
- RIF (Rule Interchange Format)
- EER (Enhanced Entity-Relationship Diagrams), Datalog, ORM (object role modeling)
- the meta model of schema.org
- SKOS (Simple Knowledge Organization System)
- FOL, F-logic, Common Logic

# Diversity of Languages: Curse or Blessing?

Babelonyan confusion?





# Example: OMG's Date-Time Vocabulary (DTV)

The Date-Time Vocabulary is a heterogenous ontology:

- SBVR: very expressive, readable for business users
- UML: graphical representation
- OWL: formal semantics, computationally tractable
- Common Logic: formal semantics, very expressive

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DTV combines the advantages of different languages



# Challenge for DTV

How do the UML DTV parts relate to each other?

- Are the SBVR axioms and the OWL axioms logically consistent?
- Is everything in the OWL ontology logically entailed by the Common Logic ontology?
- Synchronization has to be checked manually relying on intuition.

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DTV has the parts, but cannot glue them together to a whole

# What is missing to address DTV's challenge?

A metalanguage that enables

- the combination of ontologies (that may be written in different languages) into a larger ontologies
- the specification of the intended relationships between two different ontologies (e.g., that one is a fragment of another)

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Goal of OntoOp: provide a metalanguage that enables these functionalities for ontologies, specifications, and models (OSMs).

# Existing Work

- Distributed Ontology Language
- ISO Working Draft
- Implementation in Heterogenous Tool Set (Hets)
- Implementation in OntoHub (in alpha)

# Major changes since New Brunswick

- Scope: ontologies, specifications, models
- More, better use cases
- Requirements linked to use-cases

# Changes since AB meeting

- Reference to Decision Model Notation (DMN)
- Requirements for relationship of between the metalanguage and translations

# Relationship to SIMF I

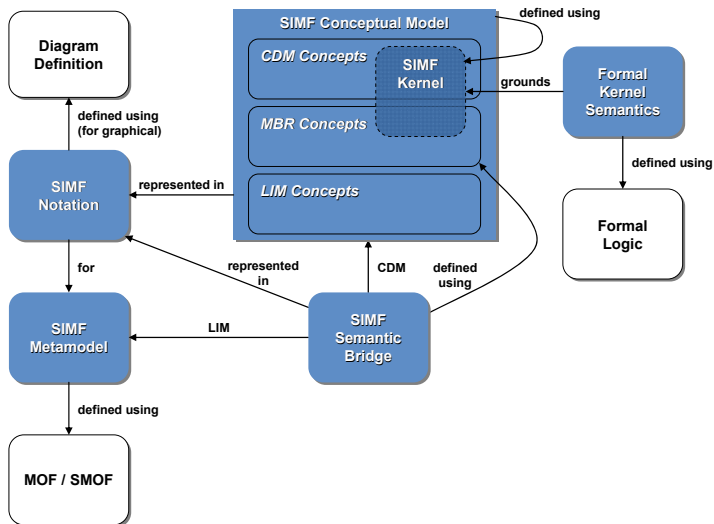


Figure 2 SIMF Language Definition



# Relationship to SIMF I

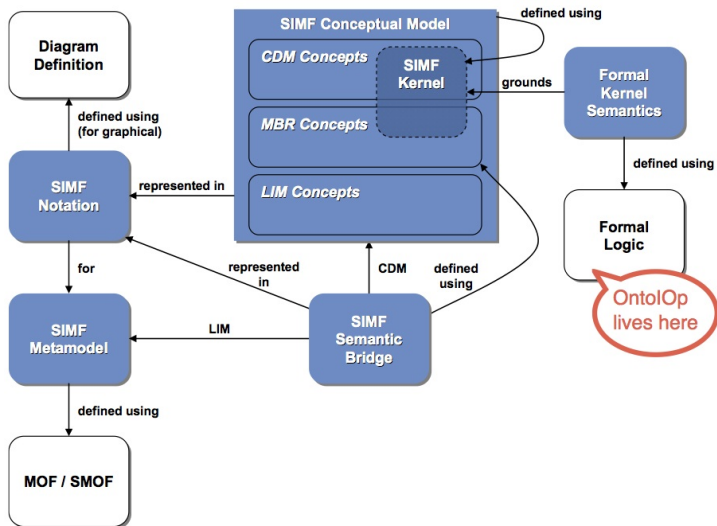


Figure 2 SIMF Language Definition

# Relationship to SIMF II

## 6.3.2 Relationship to other OMG Documents and work in progress

*“Semantic Information Modeling for Federation (SIMF) requests a modeling language for supporting information modeling and federation. The SIMF RFP requires that the semantics of the SIMF language will be grounded in formal logic, but the development of the logical foundation that is necessary to support SIMF is not within the scope of SIMF. The OntoOP metalanguage will be able to provide the logical foundation for SIMF, in this sense OntoOp complements SIMF. – Because of the complementary nature of SIMF and OntoOP, submitters for OntoOP are expected to coordinate with the submitters for SIMF.”*

Thank you

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# Not Yet Another Ontology Language

- OntoOp does not look for a ‘Lingua Franca’
- OntoOp asks for a *metalanguage* for talking about OSMs

# Requirements: Relationships between OSMs

Proposals shall provide a specification of a metalanguage for the following relationships

- **logically heterogeneous OSMs**
- **modular OSMs**
- **module extraction, approximation**
- **links** (imports, interpretations, equivalences, renamings, alignments) between OSMs
- **combination** of OSMs along links

- The OntoOp metalanguage is not supposed to ‘magically’ create interoperability between OSMs.
- It enables the formal specification of the relationships between OSMs.
- This can be used by tools (like Hets) to create interoperability (when possible).