



The OOR Initiative – An Update

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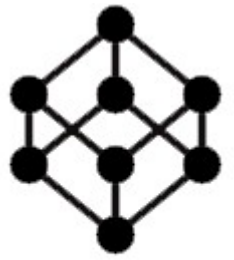
Presented at the

Joint NCBO-OOR Panel Session: "Kicking-off the Next Phase of Collaboration"

13-September-2011

(v1.02)

Session page: http://ontolog.cim3.net/cgi-bin/wiki.pl?OOR/ConferenceCall_2011_09_13



OOR

2011.09.13 - *Stop Press!*

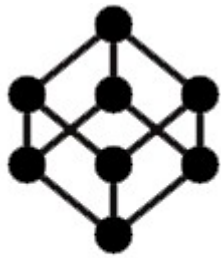
- **Announcing the new OOR Logo**



Designed by: Ali Hashemi

Final winner out of 24 designs submitted logo designs

Ref. http://ontolog.cim3.net/cgi-bin/wiki.pl?OOR_Logo_Candidates

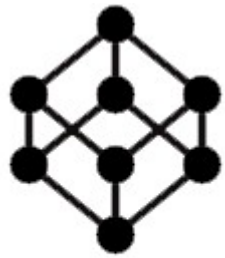


OOR Charter

Promote the global use and sharing of ontologies by:

- Establishing a hosted registry-repository;
- Enabling and facilitating open, federated, collaborative ontology repositories, and
- Establishing best practices for expressing interoperable ontology and taxonomy work in registry-repositories.

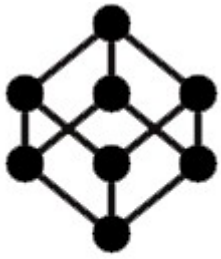
<http://OpenOntologyRepository.org>



Open Ontology Repository

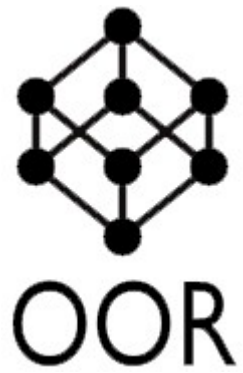
OOR

- Community effort since January 2008
- Promote global use & sharing of ontologies
 - Modular open source registry/repository software
 - 1 or more public instances
 - Best practices for ontology sharing and management
- **The OOR Initiative ... as**
 - A public infrastructure/resource
 - An open source software project
 - A platform for value-added service
 - A global federation (of projects and institutions)

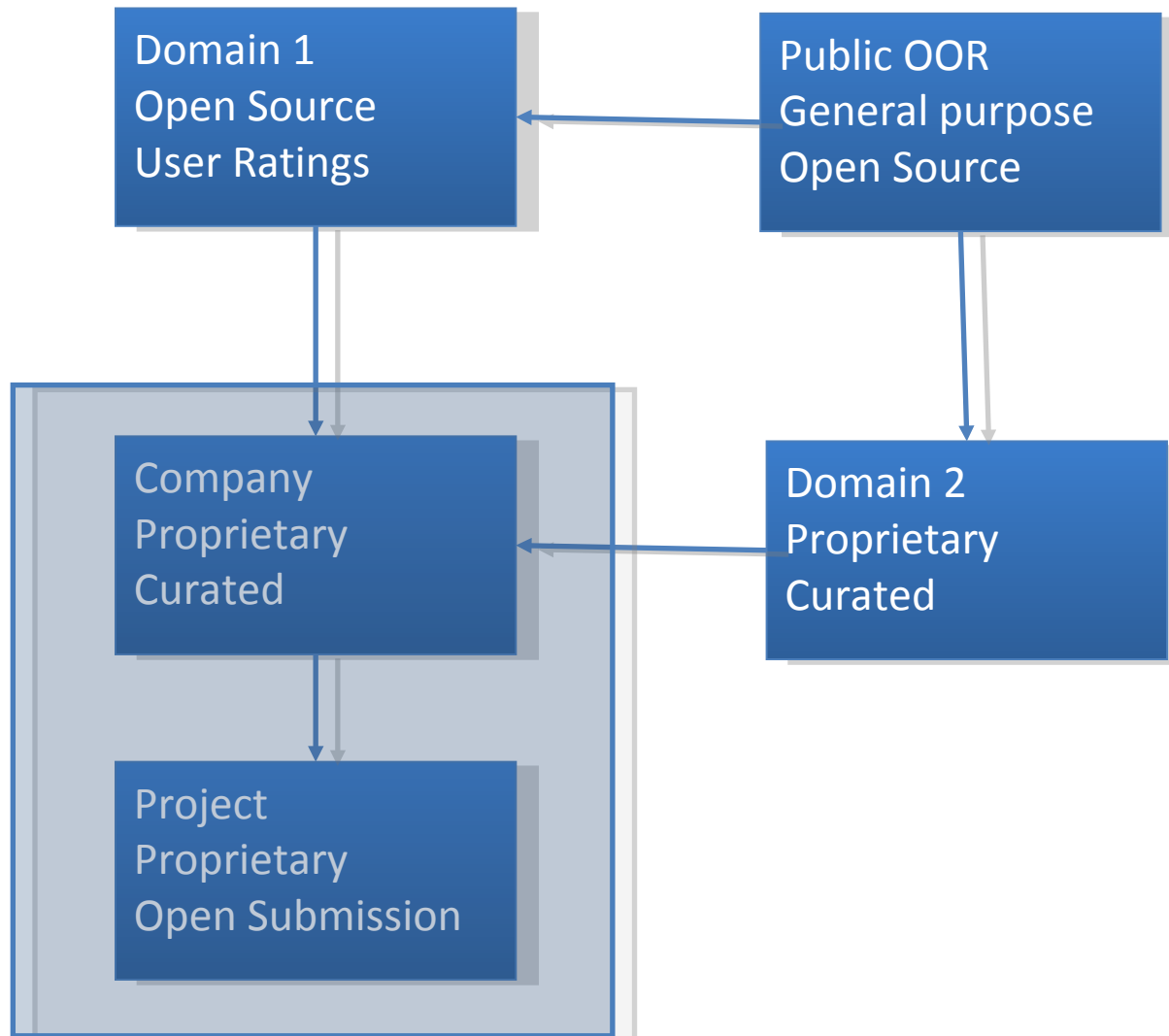


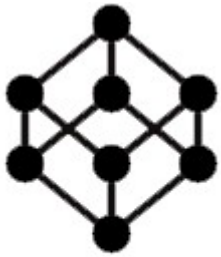
OOR Goals

- A well-maintained, high availability, high performance persistent store where ontological work can be stored, shared and accessed consistently;
- Mechanisms for registering and “governing” ontologies, with provenance and versioning, **made available (logically) in one place** so that they can be browsed, discovered, queried, analyzed, validated and reused;
- Services across disparate ontological artifacts supporting cross-domain interoperability, mapping, application and inferencing; and
- Registration of semantic services to support peer OORs



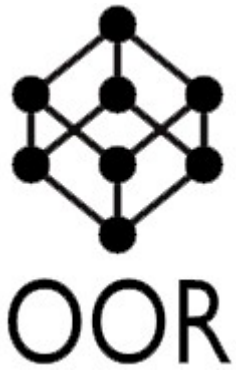
Deployment Example





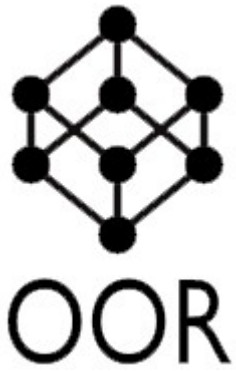
OOR **Current Participation**

- Technology contributions from
 - NCBO / Stanford-BMIR
 - CIM Engineering (CIM3)
 - Raytheon BBN
 - Northeastern University
 - University of Toronto
 - University of Bremen
 - SOCoP – Spatial Ontology Community of Practice
 - NeOn, ONKI, ICOM, SIO, ... *more ... (Your Organization?)*



Current Participation (con't)

- Mailing list with **over 130 subscribers worldwide**
- Between Jan 2008 and now: we've had 107 meetings and virtual events (team meetings, invited talks, panel discussions in the form of augmented conference calls)
- **OOR IPR Policy** adopted in 2010 – **an IPR regime that encourages open collaboration and unencumbered reuse** – Simplified (2 clause) BSD code License; acceptance of libraries under either “gift” or “reciprocal” software License; and Creative Commons “Attribution Only” (CC BY 3.0) content License for the Open Public OOR instance(s)
- Featured at workshops & conferences: OntologySummit2008, ISWC 2009, CENDI/NKOS 2008 & 2009, MBARI 2009, SemanticWeb-MeetUp 2009, SOCoP 2009, ORES 2010/ESWC 2010, SemTech 2010, SERES 2010/ISWC 2010, DataONE-ISWG 2011, ...
- Contributing to the discourse: communities and projects like BioPortal, NEU-Courses, COLORE, OMV, NeOn, ONKI, SIO, ORATE/HETS, SOCoP, ICOM, XMDR, MMI, ORNL, MetHet, ... and dozens of individuals from the ontology, semantic web, data modeling, enterprise architecture and software engineering communities



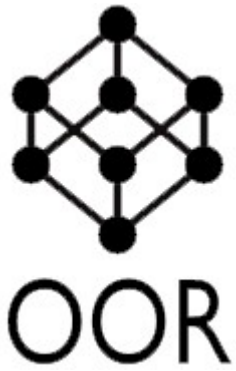
Goals

Provide an architecture, specification and infrastructure that supports

- Creation, sharing, searching, and governance-management of ontologies,
- Enabling and facilitating open, federated, collaborative ontology repositories,
- Multiple implementations

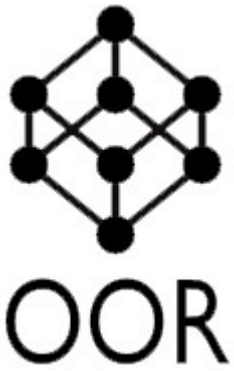
Complementary goals

- Fostering collaboration among all users of ontologies
- Identification and promotion of best practices for expressing and sharing interoperable ontologies
- Provision of services relevant to the RDFS and OWL ontologies and RDF instance stores.



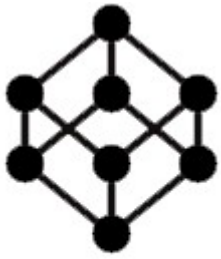
Assumptions

- OOR Supports Evolutionary Development
- Partitioning of Functionality
- OOR does not store instance data apart from that of the OOR infrastructure (**not resolved**)
- OOR Supports arbitrary representation languages
 - Repository architecture (mostly) independent of language
 - Initial support for OWL
- Meta/Provenance information crucial
- Standards based to extent possible



Architecture Principles

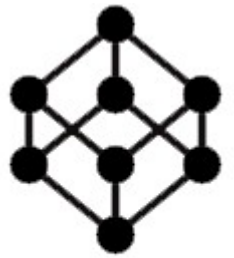
- OOR shall support evolutionary development
- OOR shall support distributed federatable instances
- OOR shall be scalable
- OOR shall support federation
- OOR shall provide services decoupled from core repository functionality
- OOR shall have no hierarchical dependencies
- OOR shall support arbitrary ontology representation languages
- OOR shall be ontologically driven
- OOR shall be platform independent



OOR

Use Cases

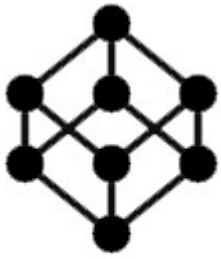
- Sources for use cases
 - OOR Requirements
 - ISO 11179
 - Existing ontology repositories
- Use cases are available at
<http://www.ccs.neu.edu/home/kenb/ontologies/oor-usecase.xml>



OOR

Classification of Use Cases

- Administer user authorizations and privileges
- Assign identifiers
- Define workflows and policies
- Federate OOR instances
- Harmonize and map ontologies
- Publicize ontologies
- Query metadata
- Register ontologies
- Review and evaluate ontologies



OOR **Architecture Status**

- **Developed Requirements**

http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Requirement

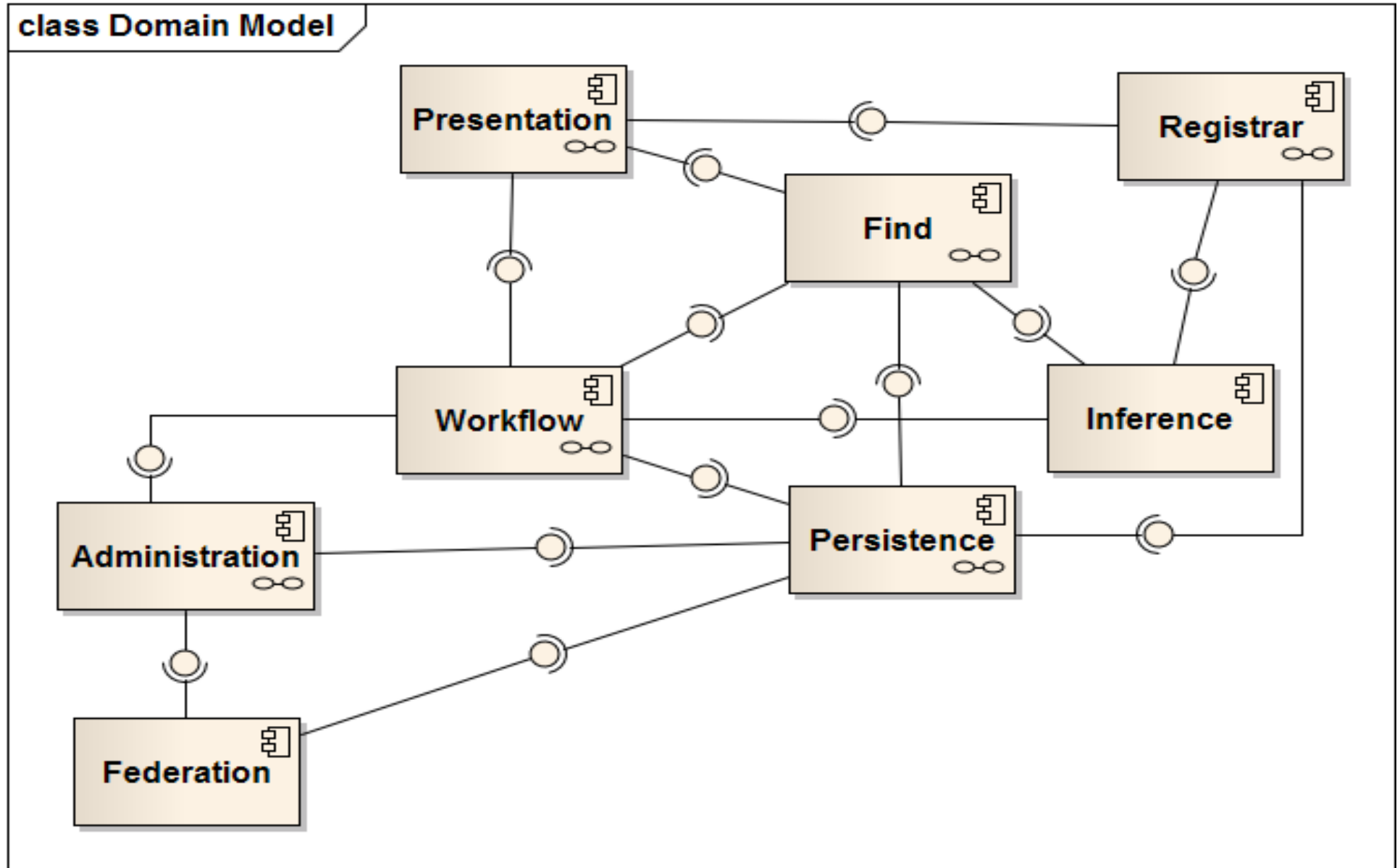
- **Collected candidate architectures**

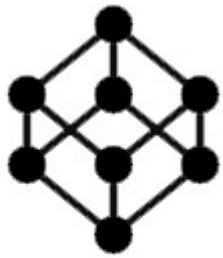
http://ontolog.cim3.net/cgi-bin/wiki.pl?OpenOntologyRepository_Architecture#nid184T

- **Draft high level software architecture**
- **Held architecture & specification workshops**
 - Ref. http://ontolog.cim3.net/cgi-bin/wiki.pl?OOR/ConferenceCall_2011_09_20#nid2WR7
 - and continuing ...



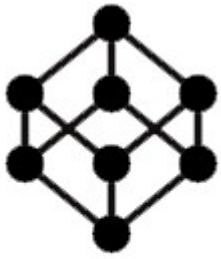
Current Architecture





OOR **Ongoing Efforts**

- Standing up an **OOR-sandbox** instance
 - <http://sandbox.oor.net>
- Standing up an **OOR-development server**
 - <http://devbox.oor.net>
- Positioning to stand up an **OOR-production** instance, which requires to be in place
 - Gatekeeping mechanisms
 - Proper policies
- Standing up an **OOR code-repository**
 - <http://oor.semwebcentral.org/>



OOOR **Ongoing Efforts (con't)**

- **OOOR-development instances**

- NCBO: BioPortal - Stanford-BMIR / Mark Musen, Ray Fergerson, Natasha Noy, Trish Whetzel, et al. - whose technology we are running, as our code-base
- NEU: gatekeeping and policy dev - Northeastern U. / Ken Baclawski, et al.
- Raytheon BBN: federation - BBN / Mike Dean, Jim Chatigny, Dan Cerys
- others: Bremen, MMI, Ryerson, ORNL, ...

Ongoing Efforts (con't)

COLORE – Common Logic Ontology Repository

- U of Toronto / Michael Gruninger
- First order logic support for OOR
- Modularization

<http://stl.mie.utoronto.ca/colore/ordering/partial-ordering.clif>

```
(cl-module partial-ordering.clif
  (forall (x)
    (leq x x))
  (forall (x y)
    (if (and (leq x y)
              (leq y x))
        (= x y)))
  (forall (x y z)
    (if (and (leq x y)
              (leq y z))
        (leq x z)))
  (forall (x y)
    (iff (lt x y)
         (and (leq x y)
               (not (leq y x)))))
)
```



semantic technologies laboratory

COLORE

[COLORE](#) | [ONTOLOGIES](#) | [METADATA](#) | [PUBLICATIONS](#) | [TUTORIALS](#) | [CONTACT](#)

Ontologies

The ontologies in the repository are informally divided into the following clusters:

- *Foundational Ontologies*

These ontologies axiomatize the general mathematical structures that serve as the basis for the representation theorems of other ontologies in the repository.

- *Generic Ontologies*

The concepts axiomatized in these ontologies cover the range often associated with "upper ontologies".

- *Domain Ontologies*

These are ontologies that extend one or more generic ontologies, and which are associated with particular application domains.

Foundational Ontologies

- [Graphs](#)
- [Incidence Structures](#)
- [Linear and Partial Orderings](#)
- [Lattices](#)
- [ContactAlgebras](#)
- [Algebra](#)

Generic Ontologies

- [Time](#)
- [Duration](#)
- [Process](#)
- [Mereotopology](#)
- [Geometry](#)
- [Shape](#)

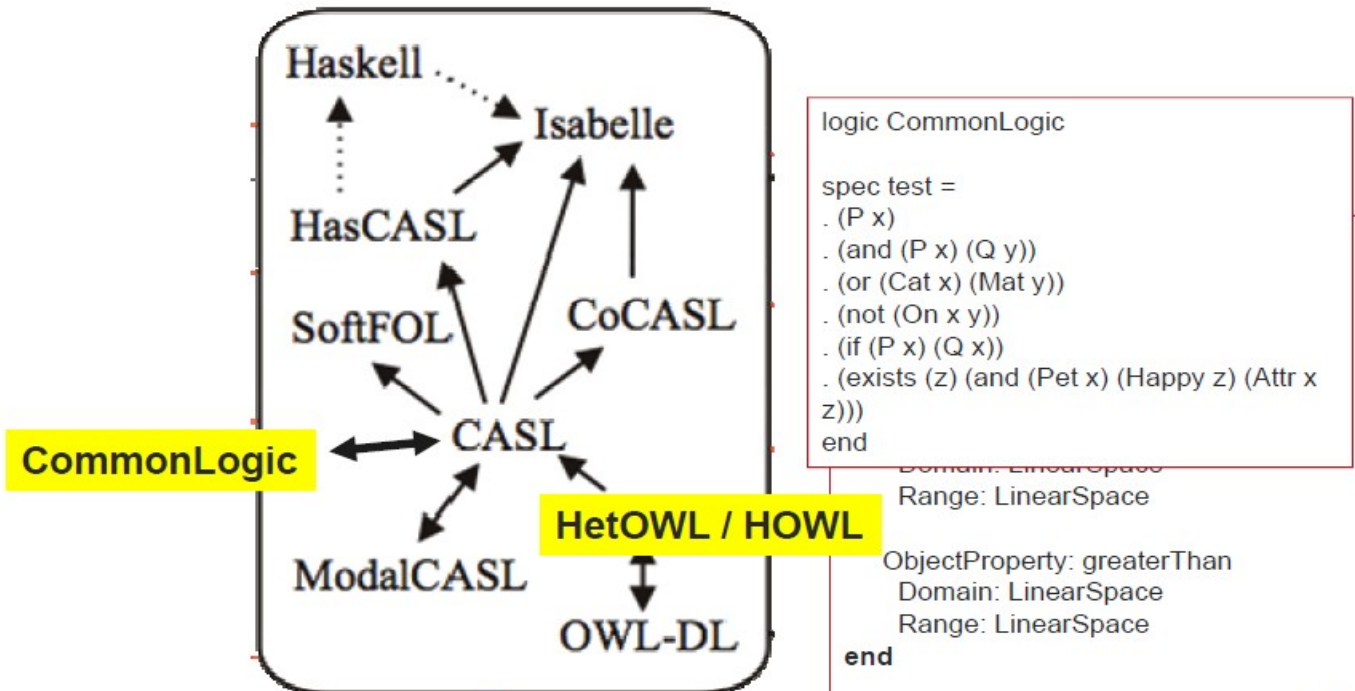
Domain Ontologies

Ongoing Efforts (con't)

HeTS – the Heterogeneous Tool Set

- Bremen U (Germany) / John Bateman, et al.
- Inter-ontology mapping, ... etc.
- a key contribution to the **just (Jun-2011) agreement to start on ISO NP 17347 Ontology Integration and Interoperability Standard (OntoOp) development**

HeTS: Continuing extension of the treated logics



Next Steps:

- integration of HeTS 'behind the scenes'
 - access to reasoners
 - move beyond OWL
 - extension to our full complement of alignment shapes
- semantic versioning

Ongoing Efforts (con't)

SIO – Sharing and Integrating Ontologies

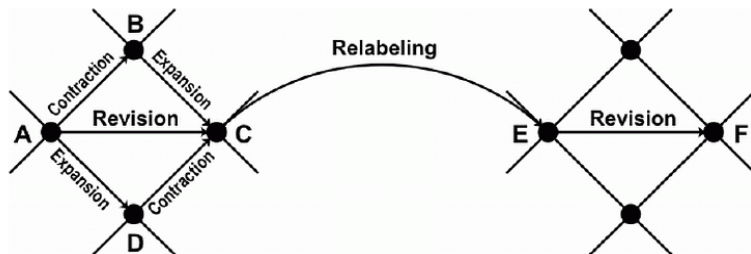
- John Sowa and numerous contributors from the Ontolog Forum
- Applying the “**Lattice of Theories**” to resolving the classical challenges of interrelating disparate ontologies
- adopting a **crowd-sourcing approach**

The SIO Players:

(the usual suspects: custodians from the UpperOntologySummit, ... etc.)

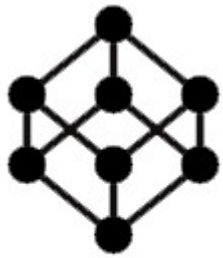
Lattice of Theories

For any given logic, the set of all possible theories expressible in that logic forms a lattice.



The ordering is defined by specialization and generalization.
Adding axioms to a theory creates a more specialized theory.
Deleting axioms creates a more generalized theory.

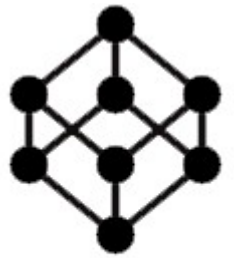
Pat Cassidy – COSMO, CDV, PIFO
Aldo Gangemi - DOLCE - Description & Situation extensions
Michael Gruninger - PSL / ISO 18629
Nicola Guarino - DOLCE
Barry Smith – BFO
Matthew West - ISO 15926
Adam Pease - SUMO
Doug Lenat - OpenCyc
John Bateman - Spatial Cognition, GUM, CASL, HeTS
John Sowa – Lattice of Theories
etc. ... and YOU!



OOR

Current Priorities

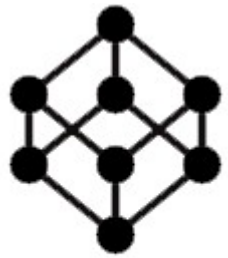
- Continue in depth R&D in Architecture, API, metadata, CL support, ...
- **Coordinate development efforts with the BioPortal team** – now that we have reverted a “fork” back to a “branch” code development mode
- Continue to push OOR development and get more contributors
- Set up **policies and process – to facilitate contributions to OOR work**
 - Clear and easy policies and process to engage developers and have them contribute code
 - Build out "gatekeeping" and move from just having an OOR-sandbox to having available instances of an OOR-sandbox, an OOR-devbox and a high availability persistent public OOR-production server
 - Clear and easy policies and process to engage content stewards and have them contribute ontologies to our public instance of OOR
- Get funding to continue and extend the work
- **Systematically solicit content contribution and engage major content communities**
- Regularly review requirements and existing standards to make sure we are on track; and to **promote and contribute to ontology standards efforts**
- Continue efforts in publicity and outreach



OOR

To Join the effort

- Join the [oor-forum] mailing list - oor-forum-join@ontolog.cim3.net
- Come to our OOR-team weekly conference calls - Tuesdays 15:30 UTC (8:30am PT)
- See: <http://OpenOntologyRepository.org>
- E-mail any one one of us if you have a question (our email addresses are on the cover slide)



OOR

Sandbox / DevBox - Status

- Customization of BioPortal
 - GUI component (Presentation)
 - Core component (Registrar, Find, Persistence and Inference)
 - Admin component (Administration)
- Workflow component
 - Based on JBPM workflow engine
 - Not yet integrated with other components
- No Federation yet
- See an earlier comparative analysis ...

15-October-2009 - "[OOR-BioPortal Comparative Analysis](#)" panel discussion