The OOR Initiative – An Update

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

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2011.09.13 - Stop Press!

• Announcing the new OOR Logo

Designed by: Ali Hashemi

Final winner out of 24 designs submitted logo designs

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

- 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)
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

Domain 1
Open Source
User Ratings

Public OOR
General purpose
Open Source

Company
Proprietary
Curated

Domain 2
Proprietary
Curated

Project
Proprietary
Open Submission
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)
- 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
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
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
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
  
  
  – and continuing …
Current Architecture
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/
Ongoing Efforts (con’t)

- OOR-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
  - 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
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 (OntoIOp) 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.)

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!

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.
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
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)
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