An Organization Ontology Based on ROR

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New Ontologies for VIVO

The VIVO Ontology Interest Group has been creating new ontologies for the representation of scholarship, conformant with best practices in interoperable and scalable ontology design

Domains of representation include "necessary" and "independent" domains beyond scholarly works and people, and include time, locations, events, languages, and organizations.

For background see Early Thoughts on Related Domains

People, their activites, interests and accomplishments

Awards / Honors	Teaching	Memberships
Education / Credentials	People	Positions
Research		Mentoring
Interests	Service	Impact

Things that are often created in the context of a reference to a person, but exist independently

Scholarly Works	Courses	Projects / Grants

Things that might be referenced by people. These can be managed independently of references to people

Concepts (SKOS)	Organizations (ORG)	Research Resources (ERO)
Dates and Times (TIME)	Journals (IAO)	Locations (TBD)
Academic Events (AEON)	Languages (LANG)	Academic Degrees (ADO)

Domain Definition

The Organization Ontology is used to represent basic facts regarding organizations, their structure, functions, interests, locations, and their associations with other organizations and people.

Ontology Competency Questions

1. What organizations, in this region, have this interest? Have this disposition? How can I get in contact with these organizations?
2. What is the organizational chart of this organization? How many departments does this university have? How many branches does that company have?
3. Which organizations are members of this association?
4. What people have memberships, affiliations, or other roles in which organizations?
5. How can I learn more about this organization? What is its home page, its Wikipedia page?
6. How did this organization come to be and/or come to end? What documents, people, other organizations were involved in the creation, change, or end of this organization?
7. How is this organization identified in registries of organizations?

Consequences and Observations

1. Associating scholarly works, outputs, and projects with organizations is beyond the scope of this ontology. Other ontologies represent scholarly works.
2. Similarly, associations of organizations with performances and events are beyond the scope of this ontology. Other ontologies represented performances and events.

ror.org

Welcome to the Research Organization Registry Community

ROR is a community-led project to develop an open, sustainable, usable, and unique identifier for every research organization in the world.

Basic Formal Ontology

- Basic Formal Ontology (BFO) is an upper level ontology developed to represent the natural world
- BFO is concerned with questions of existence
- BFO classifies all entities as either "continuants" (things that exist through time such as people, scholarly works, measurements, and locations) and "occurents" (things that "unfold themselves in time" such as performances, processes, projects, and relationships)

BUILDING ONTOLOGIES WITH
BASIC FORMAL ONTOLOGY

ROBERT ARP | BARRY SMITH | ANDREW D. SPEAR
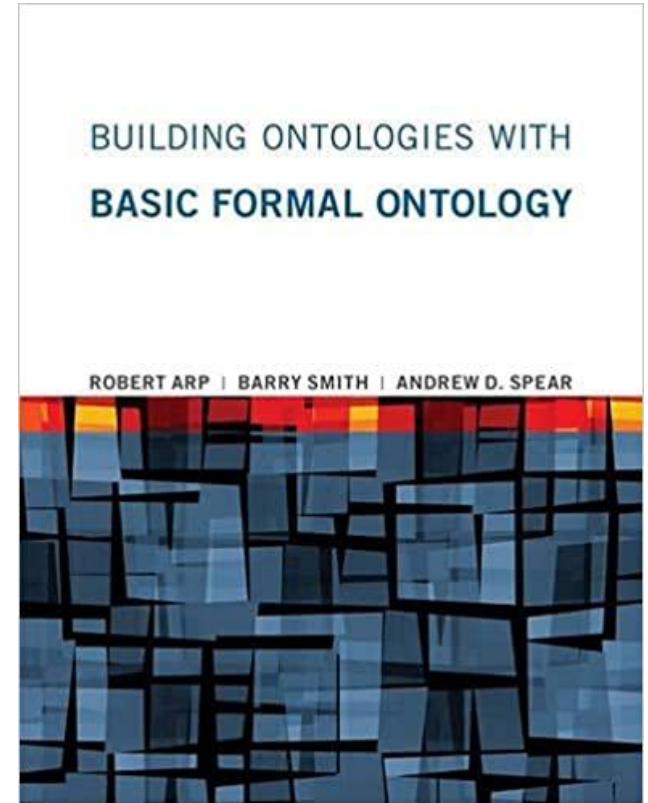
Open Biomedical Ontologies

The Open Biomedical Ontologies (OBO) is a collection of ontologies, using BFO as an upper level ontology and conformant with the OBO Principles for design of scalable and interoperable ontologies.

OBO is a large active community with more than 232 adopted ontologies and many more under development. VIVO is an OBO ontology, but not conformant with the OBO Principles. New ontological work, such as AEON, LANG, and the Organization Ontology are intended to be conformant.

The OBO community also produces tools such as robot for processing ontologies, including validation, inference, templates, and SPARQL query, and Ontobee, a website for finding and using terms from OBO ontologies.

Subsumption -- "what 'is a' what?"
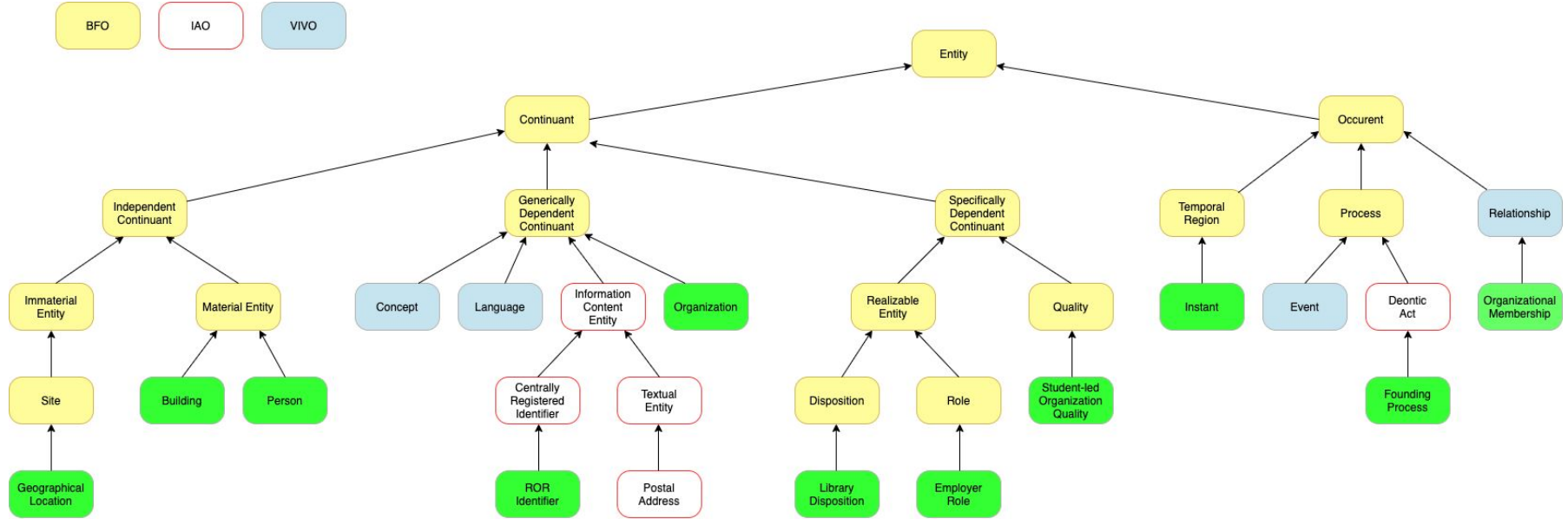
This sample subsumption hierarchy shows example subsumption for various types of things in the Organization Ontology. For a full subsumption, use WebVOWL.

What is an Organization?

- An organization is not merely a collection of people
- An organization is created by people for a purpose -- to educate, to create art, to make money, to win elections, to serve others, to conduct warfare, and many others
- All organizations, formal and informal, are created by deontic acts -- the organization has rights and responsibilities the creators of the organization did not have. This is true whether the organization is a university, a nation, or a chess club
- Organization types are defined by their creation processes. For example, government organizations are created by governments, organizational parts are created by the parent organization

Note: In OBO, an organization is defined as a material entity. This appears to be incorrect. Perhaps an organization is generically dependent on the people and processes of it creation and continuance. These can be changed over time and the organization continues to exist.

What are the types of organizations?

In a BFO ontology, an entity should not be more than one type -- a cat is not a dog, for example. The organization ontology currently defines five mutually exclusive organization types
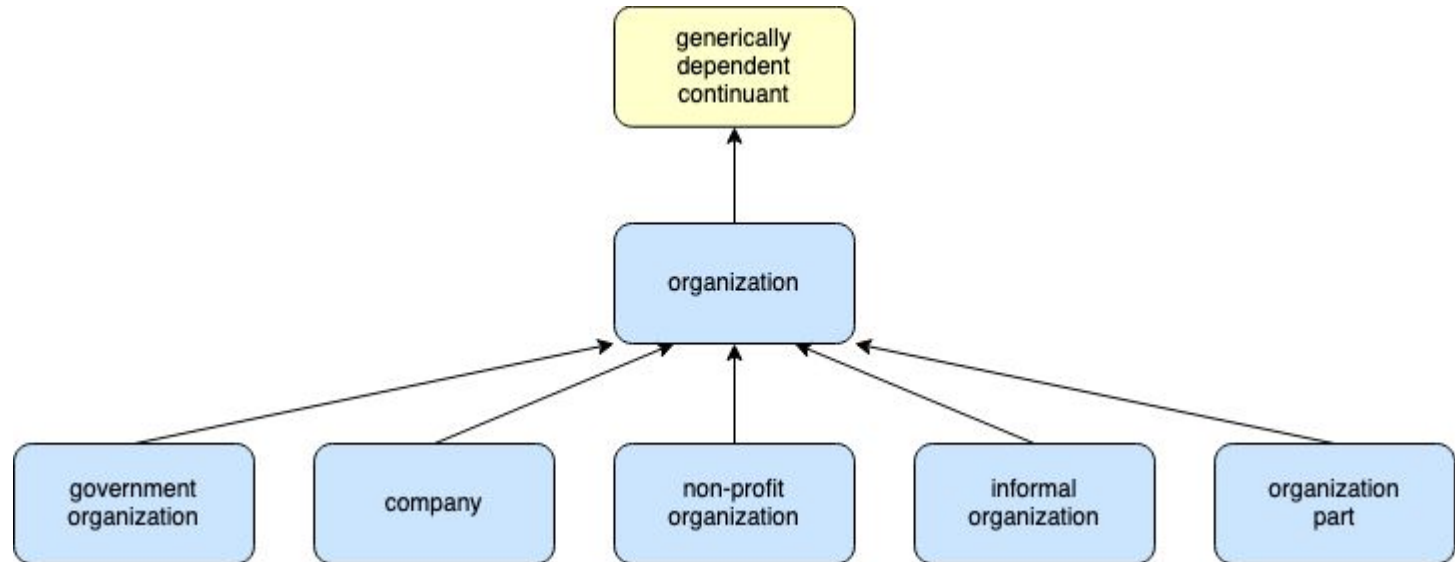
What are the purposes of organizations?

A disposition is such that should the disposition cease to exist, the bearer is physically changed. Organizations that change their dispositions (a library becomes a museum, for example) are physically changed -- the people may change, the facilities may change, the collections held by the organization may change.

The Organization Ontology defines 40 dispositions. More are easily added. Organizations can have any number of dispositions.

What are the qualities of organizations?

In BFO ontologies, qualities are specifically dependent (in our case on specific organizations) and do not need processes to be realized.

Some organizational qualities:

- Number of employees
- The quality to be a student-led organization

Some qualities are qualities of other entities. A postal address may have a "registered address" quality, for example, being the quality of an address used in a registration process.

How do organizations relate to other entities?

To other organizations

has organizational part, has organizational affiliate, has organizational successor, has organizational spin-off, has organizational member
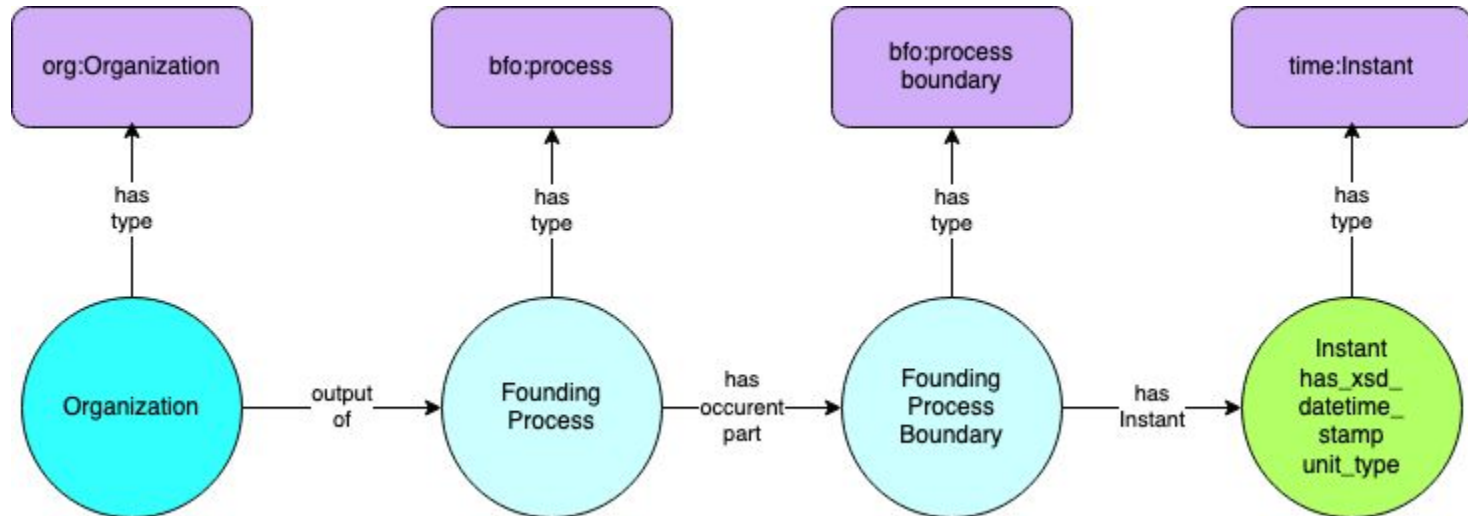
To locations

occupies

To people

has employee, has person appointee, has person member, has person head, has person volunteer

Time

The Organization Ontology uses terms from the W3C Time Ontology to represent time instants. Time instants are declared to be BFO zero-dimensional occurrents.

In BFO, events, such as the founding of an organization, occur in time as shown below

Location

Locations are either "areas" of the surface of the earth, such as continents, countries, populated places, and campuses, or points on the surface of the earth with latitude and longitude.

Locations are "located in" other locations. The point 48.85,2.34 is located in The Sarbonne which is located in Paris which is located in France which is located in Europe. "located in" is transitive: if x located in y and y located in z, then x in z.

Organizations "occupy" one or more locations. The College of Sarbonne occupies The Sarbonne. Microsoft occupies Redmond Washington USA.

For additional conversation regarding locations, see Geospatial information in VIVO - thoughts, ideas, suggestions https://vivoconference.org/vivo2021/schedule/#session-34

Code and Build

Code build scripts are available here:
https://github.com/mconlon17/organization-ontology

The build.sh script merges org-header.ttl, edited with protege or text editor, with terms for classes and properties build from spreadsheet templates using robot, on OBO Tool.

Validation via SPARQL queries is done on each build

Data and documentation are included in the ontology repository

Documentation

Documentation is available here:
https://mconlon17.github.io/organization-ontology

Documentation is available as HTML, PDF, or ePub, built with GitHub Actions.

Documentation is included in the docs folder of the code repository on GitHub

For more on how documentation is produced see ReadTheDocs for VIVO Ontologies
https://vivoconference.org/vivo2021/schedule/#session-24

Docs » The Organization Ontology

View page source

The Organization Ontology

The Organization Ontology (ORG) is an ontology for representing organizations of all kinds.

The Organization Ontology uses Basic Formal Ontology (BFO) as an upper level ontology, and conforms to Open Biomedical Ontologies (OBO) Principles for constructing interoperable ontologies.

The Organization Ontology is a one of several ontologies developed for the representation of scholarship by the VIVO Project. The Organization Ontology is not limited to the representation of scholarship – it can be used to represent organizations in any setting.

In VIVO 1, organizational representation was part of the VIVO ontology. In the new VIVO ontology, organizational representation has been removed in favor of this new Organizational Ontology. The Organizational Ontology is independent of VIVO and can be used in any setting where information about organizations needs to be represented.

An organization is a group of people with a purpose. It is not merely a group of people – that would be a collection of people, not an organization. The purpose may be explicit or implicit. Organizations may be legally constituted or informal. Organizations may be parts of other organizations.

See Organizations for subsumption and subtypes.

The Organization Ontology is designed to insure it can represent Research Organization Registry data. ROR is a curated, CC0 collection of facts regarding over 97,000 research organizations in the world. The Organization Ontology can represent these facts for use in graph-based systems such as VIVO.

See the domain definition for an extended defintion with competency questions, and consequences.

Tools are provided with the Organization Ontology for retrieving ROR data and creating individuals with assertions as RDF triples using the Organization Ontology.

Contents

- Organization Ontology Domain Definition
- Organizations
- Identifiers
- Addresses
- Facilities
- Locations

Data

Dates

The Organization Ontology uses data entities represented using the W3C Time ontology.

Entities with year precision representing dates from 1800-2050 are included as a template, triples, and a script

Locations

The Organization Ontology uses entities representing locations defined using internal terms.

A spreadsheet, conversion script, and triples are included for countries and continents of the world

ROR Organizations

The Organization Ontology includes a script for fetching and rendering ROR data as Organizational Ontology Triples.

Any ROR organization can be fetched and rendered

Thank you

Thank you to the VIVO Ontology Interest Group for many interesting conversations. They are conducting reviews of the Organization Ontology and will substantially improve the work as collaborators.

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