



WikiProject Ontology Needs You

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WikiProjects Days, 20 June 2026



The WikiProject Ontology is all about the ontology of Wikidata. This should make it the central and most vibrant project of Wikidata. This talk will describe some of the aspects of the Wikidata ontology that need attention and what could be done to improve Wikidata by improving the Wikidata ontology. The session will also have a description of some of the ontology problems that will invite discussion of approaches to solve them.

Prerequisite knowledge: general knowledge of Wikidata.

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Goal: Get more Wikidatans working on the Wikidata ontology



What is ontology? “Ontology is the philosophical study of being.”

<https://en.wikipedia.org/wiki/Ontology>

- What kinds of things exist. How they relate.

What is an ontology? “In information science, an ontology encompasses a representation, formal naming, and definitions of the categories, properties, and relations between the concepts, data, or entities that pertain to one, many, or all domains of discourse. ...”

[https://en.wikipedia.org/wiki/Ontology_\(information_science\)](https://en.wikipedia.org/wiki/Ontology_(information_science))

“[A]n ontology is a formal explicit description of concepts in a domain of discourse ..., properties of each concept describing various features and attributes of the concept ..., and restrictions on [these] ...”

https://protege.stanford.edu/publications/ontology_development/ontology101-noy-mcguinness.html

What Does an Ontology Do?



In essence, an ontology:

- Categories the items in a knowledge base.
 - ▶ Often by means of generalization taxonomy of classes, like *human*, *person*, and *ship*, with *person* a generalization of *human*, etc.
 - ▶ Items belong to (are instances) of classes, like *Douglas Adams* belongs to *human*
- Controls how information is represented in the knowledge base.
 - ▶ Usually by defining a set of properties, like *mother*, *beam*, and *draft*, and constraints on how properties are used, like *every human has a mother* and *the mother of a human is a human*.
 - ▶ So because *Douglas Adams* belongs to *human*, he has a mother, *Janet Adams*, who also belongs to *human*.

So an ontology is the central part of a knowledge base.

What Does the Wikidata Ontology Do?



- The Wikidata ontology categorizes items in Wikidata in a large generalization taxonomy of classes, using **instance of** and **subclass of**
 - ▶ **Douglas Adams** as an instance of **human**, and thus other classes
 - ▶ **human** as a subclass of **person**, and other classes
 - ▶ **human** as an instance of **organisms known by a particular common name**, and thus other classes
- The Wikidata ontology organizes (most?) properties in Wikidata in a generalization taxonomy of classes, using **instance of**
The Wikidata ontology organizes (some) properties in Wikidata into a generalization taxonomy of properties, using **subproperty of**
 - ▶ **vessel class** as an instance of **Wikidata property related to maritime and inland waterway transport**
 - ▶ **vessel class** as a subproperty of **instance of**

But Where Is the Control of Statements and Values?



- **Property constraints?**

- ▶ But property constraints are very wimpy:
 - ★ Exceptions are allowed.
 - ★ It's easy to create violations, even without labelling them as **exceptions**.
 - ★ E.g., **Douglas Adams's genres**
- ▶ and not very expressive
 - ★ Can't say that mothers of humans are human.

- **Shape Expressions?**

- ▶ But there are very few shape expressions in Wikidata.
- ▶ There are no general tools that enforce shape expressions.

What Else Does the Wikidata Ontology Do?



The Wikidata ontology provides (can be considered to provide) facilities

- for creating union classes and disjoint union classes
 - ▶ [watercraft](#) as the disjoint union of ship, boat, and submarine
- for organizing (meta)classes by class order
 - ▶ [watercraft type](#) as a [second-order class](#)
- for stating what should be provided for instances of a class
 - ▶ [properties for this type](#)
 - ▶ [has characteristic](#)
- for stating parts of items (mereology)
 - ▶ [part of](#) and [has part\(s\)](#)
 - ▶ [has part\(s\) of the class](#)

Why Does the Wikidata Ontology Need You?



- There are lots of issues in the Wikidata ontology
 - ▶ [Results of survey on Wikidata ontology issues](#)
 - ★ subclass/instance conflation, incorrect subclass of links, uncategorized items, etc.
 - ★ [United Nations](#) → [organization](#) ⇒ [group of humans](#)
 - ▶ *Work is need to address these issues.*
- Some facilities are missing
 - ▶ Particularly more powerful constraints
 - ▶ *What should be added?*
- Some constructs have inadequate tool support
 - ▶ Did an edit [violate some disjoint union](#)?
 - ▶ Did an edit violate class order?
- The meaning of some constructs are unclear
 - ▶ Mereology properties
 - ▶ [properties for this type](#) and [has characteristic](#)
- Some WikiProjects go their own way
 - ▶ “empty” classes, e.g., [woman](#)
 - ▶ Conflating [instance of](#) and [subclass of](#) for [gene](#), [protein](#), and [diseases](#)
- Some parts of the Wikidata ontology are really messed up
 - ▶ What is a [product](#)?

What Can You Do?



- Fix “issues”
- Reduce mismatch between Wikidata ontology and other WikiProjects
 - ▶ How to handle “empty” classes, e.g., [woman](#) and [rock music](#)
 - ▶ How to handle instances that are also subclasses
- Build or agitate for better tools
- Build formal description of constructs of Wikidata ontology
- Mediate between other WikiProjects
 - ▶ E.g., how to handle amphibious aircraft
- Build consensus
 - ▶ How should the “non-core” facilities of the Wikidata ontology work
- Write (better) documents
 - ▶ What every Wikidatan should know about the Wikidata ontology
 - ▶ So you’re adding a new domain to Wikidata, here’s what to do
- Provide help
 - ▶ To other WikiProjects
 - ▶ To new editors

Let's Make the Wikidata Ontology Better



...so the Wikidata ontology can help improve Wikidata.

Questions?

Comments? Write in [etherpad](#)

Volunteers? Write in [therpad](#)

Ask **both**

what the Wikidata ontology can do for you and

what you can do for the Wikidata ontology!