

# Industrial Ontologies Foundry

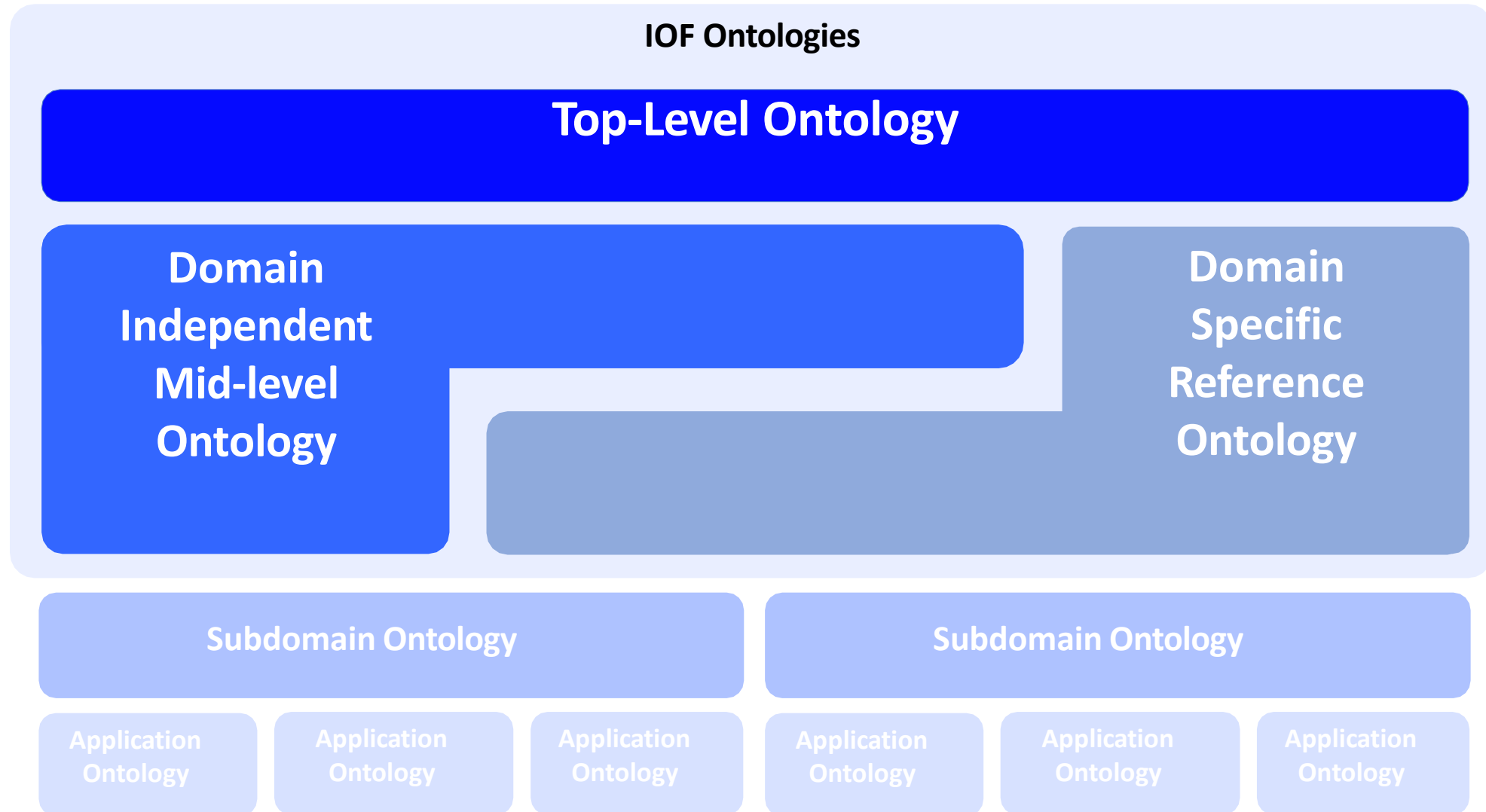
OntoCommons FW3.1

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<https://www.industrialontologies.org/>

# IOF Ontology Architecture



# IOF WGs



- IOF Core
  - Maintenance
  - Supply Chain
  - Production Planning and Scheduling
  - Product-Service Systems
  - MTConnect
  - Systems Engineering
- 
- **Technical Oversight Board**



# IOF Ontology Development Challenges

- Using natural language terms and phrases as logical symbols
  - ◆ Overcoming (implicit) biases, assumptions and context inherent in use of natural language terms and phrases
- Developing ‘useful’ natural language definitions
- Constraints imposed using OWL
- Constraints imposed using TLO (BFO 2020)
- Avoiding ambiguous and polysemous terms: e.g. part, component, subsystem
- Lack of understanding of ontological analysis techniques
- Lack of sufficiently ‘diverse’ use cases
- Taxonomy seduction – jumping into placing an entity into a taxonomy without completing an analysis

# The IOF Core WG & Core Ontology



## What We Do?

- Assist in identifying, analyzing & formalizing x-domain terms across working groups
- Curate x-domain terms into the IOF Core ontology
- Ensure consistent usage across IOF working groups / domain ontologies
- IOF Core ontology configuration & release management

## How it Came to Be?

- Q1 of 2018: IOF began a “pilot ontology” effort:
  - Create an industrial domain ontology based on BFO
  - Agree on natural language definitions
  - Map terms to BFO
  - Targeted only the “top-20” terms from submissions by IOF members
- Sept. 2019: Published a first paper of the ontology
- Oct. 2020: Reached decision to transition from a pilot and top-20 term focus to the group’s current focus

## Current Status & Plans

- ~30 industrial terms (classes)
- ~50 mid-level terms (classes)
- ~30 binary/n-ary relations
- Formalization: natural language definitions, semi-formal, first-order logic & OWL
- Status of formalization: ~70% complete
- External Release Date? TBD

## How the IOF Core Will Likely Evolve?

- Modularization to occur:
  - Mid-level terms → mid-level modules/ontologies
  - Relations → separate module
- Seek industry participation and validation (refine accordingly)
- Collaborate with other ontological efforts
  - Industry-centric
  - Domain-independent

# OAGi IOF Agreement and Transition



- **OAGi will support IOF operations**

- Wiki for working group operations (e.g., meeting agendas, meeting minutes)
- Accounting
- Promotion

- **OAGi will publish/release IOF-specified ontologies**

- According to IOF-specified licenses (e.g., MIT and CC BY 4.0)
- Using whatever forms make sense (e.g., GitHub, Zip archives)

- **Timeline**

- Transition work has started
- **Expression of an Organization's Interest in Joining the IOF Under OAGi**

<https://app.smartsheet.com/b/form/bfc21c363a654d6aa9b73ba8d0977eaa>