Ontological Semantics

Go up to Terms and Definitions

Discussion

Ontological semantics defines meaning through ontologies, ontology commitments, classes, relationships, distinctions, constraints, axioms, and domain assumptions.

An ontology captures selected semantic commitments for a defined domain. Ontological semantics explains what those commitments mean and how they shape interpretation across models, vocabularies, schemas, graphs, rules, reports, and implementation artefacts.

Ontological semantics differs from 01-conceptual-semantics. Conceptual semantics establishes domain meaning before the selection of implementation technology. Ontological semantics expresses selected domain meaning through an ontology structure.

Ontological semantics also differs from OWL semantics. OWL provides an ontology language for the Semantic Web. Ontological semantics concerns the domain commitments expressed by an ontology, whether the ontology appears as a conceptual ontology, a logical ontology, an OWL ontology, a controlled model, or another governed ontology artefact.

Ontological semantic content includes:

- domain concepts
- Classes and categories
- Relationships among concepts
- Properties and attributes
- Classifications and distinctions
- Constraints
- Axioms
- Definitions
- Domain assumptions
- Identity conditions
- Equivalence relationships
- Subclass relationships
- Disjointness relationships
- Cardinality constraints
- Inference commitments
- Traceability to conceptual meaning

A governed architecture preserves traceability from ontological semantics to the conceptual model, vocabulary, authoritative domain source, rule set, schema, graph, report, and implementation artefact that expresses or uses the ontology content.

Definition

meaning defined through ontology commitments, concepts, relationships, distinctions, constraints, axioms, and domain assumptions within a defined domain

Source

DIDO Solutions usage, informed by ontology engineering, conceptual modelling, semantic modelling practice, Gruber's characterisation of ontology as a specification of a conceptualisation, and model-driven architecture principles.

Note

Ontological semantics is not equivalent to OWL. OWL expresses ontology content when OWL provides the selected ontology language. Ontological semantics concerns the domain meaning and commitments expressed by the ontology.

Ontological semantics also does not capture all semantics of a domain. Rules, policies, reports, schemas, type systems, lifecycle models, conformance tests, and implementation artefacts express additional semantic content.

Example

An FX ontology defines `FXTrade`, `Counterparty`, `CurrencyPair`, `NotionalAmount`, `TradeDate`, `SettlementDate`, and `SettlementObligation` as domain concepts. It also defines relationships such as `hasCounterparty`, `hasCurrencyPair`, `hasNotionalAmount`, `hasTradeDate`, and `hasSettlementDate`.

Ontology content	**Ontological semantic meaning**
`FXTrade`	a trade involving the exchange of one currency for another
`Counterparty`	a party that participates in the trade
`CurrencyPair`	an ordered pair of currencies exchanged in the trade
`NotionalAmount`	the amount used to calculate settlement obligations
`SettlementDate`	the date on which settlement occurs
`hasCounterparty`	relationship between a trade and a participating counterparty
`hasSettlementDate`	relationship between a trade and the date on which settlement occurs

The ontology expresses selected semantic commitments about FX trades. A schema represents selected commitments as fields and constraints. An RDF graph represents selected commitments as triples. An OWL ontology represents selected commitments using OWL classes, properties, and axioms. Runtime validation logic enforces selected commitments during implementation.

The ontology remains governed by the conceptual meaning of the FX domain. The OWL, RDF,

schema, and implementation artefacts express selected ontology content, but they do not replace the domain meaning that the ontology represents.
