

Ontological Semantics

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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 [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.

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