



Systematic Disambiguation

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Outline

- Systematic Disambiguation
- Excellence is Hard

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Systematic Disambiguation

The core of ontology engineering as a discipline is its emphasis on systematic disambiguation, a controlled process for exhausting justifiable interpretations of data within a domain

Interoperability

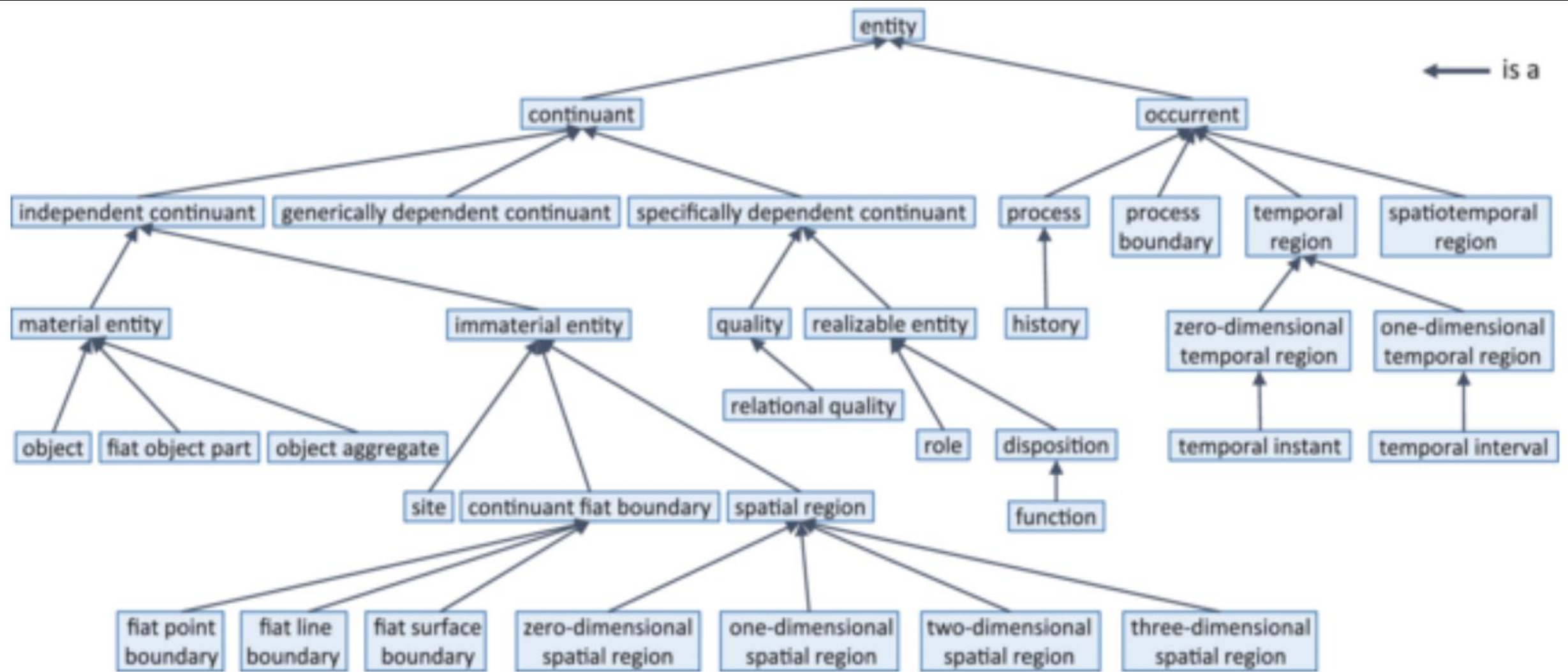
- Underwriting this process is an assumption that between any two vocabularies there is some common structure
- This applies to natural language (**Human-Human**) and formal (**Machine-Machine**)
- Ontology engineers work to identify such structures and encode them in machine-readable languages (**Human-Machine**)

Systematic Disambiguation

- Ontology engineering is not linguistics
- Ontologists care about words used by domain experts, but we aim to describe and derive that use rather than legislate or prescribe it
- We aim to disambiguate domain expert language in the interest of generating formal structures underwriting language use

Outline

- Systematic Disambiguation
- Bucket Strategy



Bucket Strategy

- Terms should be vetted by **subject-matter experts**
- For each term, evaluate along each column whether there is a justifiable interpretation of that term under a BFO class
- For example, "soldier" may be understood as a role or as an individual bearing the role

			MAJOR BUCKETS			
TERM	Material Entity	Quality	Disposition	Role	Process	Information
soldier	soldier (person)	X	soldier disposition	role of soldier	acting as a soldier	soldier (description)

	MAJOR BUCKETS					
TERM	<i>Material Entity</i>	<i>Quality</i>	<i>Disposition</i>	<i>Role</i>	<i>Process</i>	<i>Information</i>
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Sound Familiar?

- When building a design pattern, describe:
 1. Material entities within scope, i.e. **Material Entity**
 2. Qualities these material entities have, i.e. **Quality**
 3. What these material entities can do, i.e. **Process**
 4. What properties underwrite what they can do, i.e. **Realizable Entity**
 5. Where these material entities and their boundaries are located, e.g. **Immaterial Entity**
 6. When these entities exist, e.g. **Temporal Region**
 7. Information we use to talk about 1-6, i.e. **Generically Dependent Continuant**

Classes

- Material Entities –
- Qualities –
- Processes –
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information –

At what speed does a patrol boat move in knots over an hour?

Classes

- Material Entities – **Patrol boat**
- Qualities –
- Processes –
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information –

At what speed does a patrol boat move in knots over an hour?

Classes

- Material Entities – Patrol boat
- Qualities –
- Processes – **Act of motion**
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information –

At what speed does a patrol boat move in knots over an hour?

Classes

- Material Entities – Patrol boat
- Qualities –
- Processes – Act of motion, **speed?**
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information – **speed?**

At what **speed** does a patrol boat move in knots over an hour?

Classes

- Material Entities – Patrol boat
- Qualities –
- Processes – Act of motion, speed*
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information – speed*

use * to note
ambiguity then move
on; we will revisit

At what speed does a patrol boat move in knots over an hour?

Classes

- Material Entities – Patrol boat
- Qualities –
- Processes – Act of motion, speed*
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information – speed*, **knots measurement**

At what speed does a patrol boat move in knots over an hour?

Classes

- Material Entities – Patrol boat
- Qualities –
- Processes – Act of motion, speed*
- Realizables –
- Sites & Boundaries –
- Temporal Region – **hours***
- Information – speed*, knots measurement, **hours***

use * to note
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At what speed does a patrol boat move in knots over an hour?

Local vs Global Disambiguation

- Ambiguities are treated differently depending on whether you are systematically disambiguating or addressing a competency question
- In the latter, we leverage the competency question to determine which sense of a given term is most relevant, then **use that sense** in our pattern
- In the former, we include **any justified sense** of a given term in our pattern

Local vs Global Disambiguation

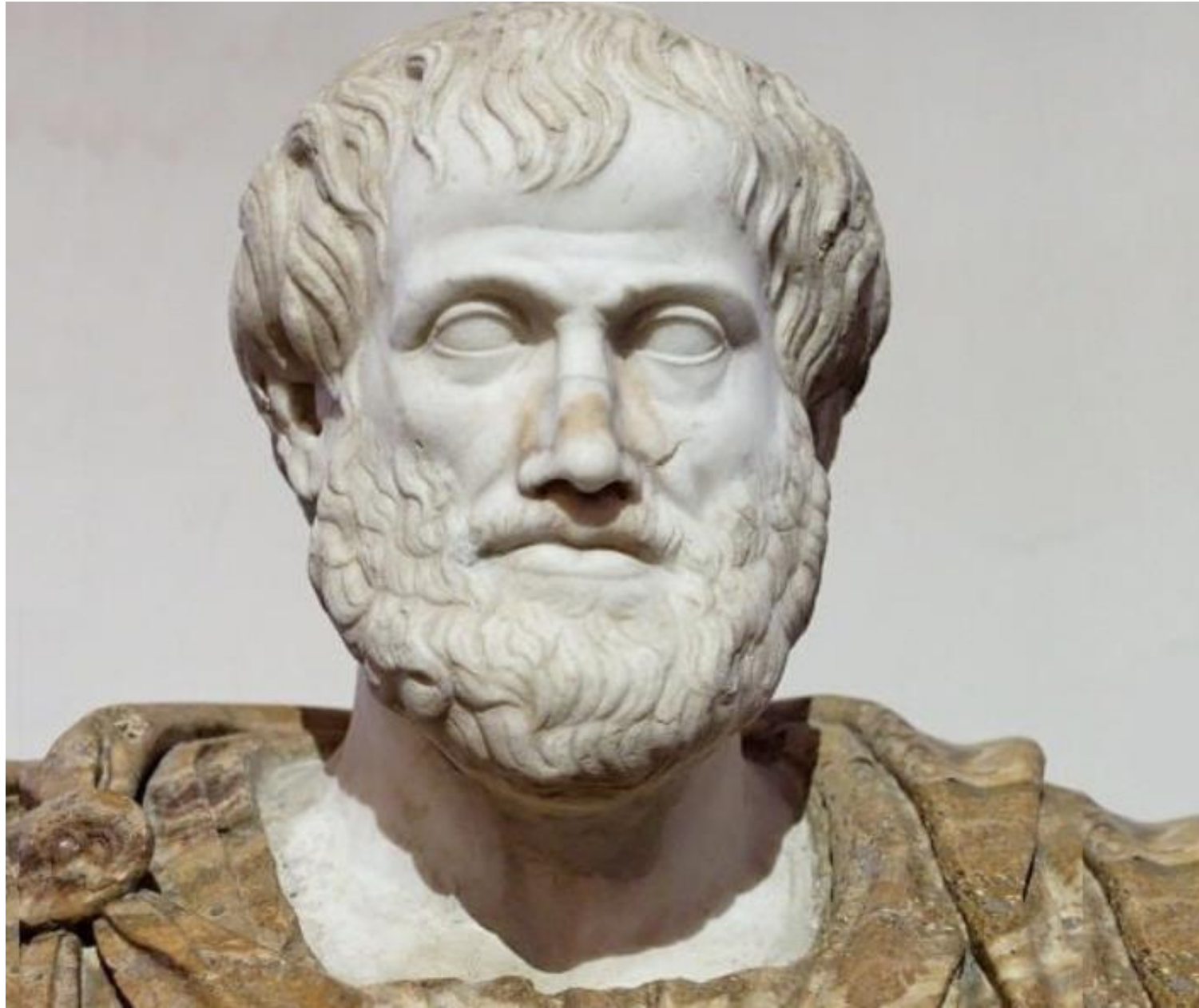
- Much ontology engineering work is pursued using competency questions to drive the construction of representations
- That is of course incredibly valuable when moving at the speed of mission is crucial
- It does, however, **often result in information silos**

Local vs Global Disambiguation

- On the other hand, ontology engineering pursued via systematic disambiguation provides that “whole cloth” I’m always going on about
- From which mission-specific representations can be derived while retaining semantic alignment with the whole
- Here, competency questions are used to **identify which parts of the larger graph to use in application**

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- Qualities –
- Processes –
- Realizables –
- Sites & Boundaries –
- Temporal Region –
- Information –

On what day(s) of the week does the UK prime minister have tea?

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- Qualities –
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Relations

- Qualities to Material Entities –
- Realizables to Material Entities –
- Processes to Material Entities –
- Realizables to Processes –
- Location to Material Entities –
- Entities to Temporal Region –
- Information to Carriers –

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