

Semantic Enrichment Introduction and Use Case at AbbVie

Helmi Fournier

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Version 1



abbvie

What is Semantic Enrichment ?



What is Semantic Enrichment?

Semantic enrichment is the **process** of adding a layer of **metadata** to content so that **machines** can **make sense** of it and **build connections** to it.

Source:

"How Smart Is Your Content? Using Semantic Enrichment to Improve Your User Experience and Your Bottom Line"

Michael Clarke and Pam Harley. Science Editor • Spring 2014 • Vol 37 • No 2

Knowledge Organization Systems

Controlled Vocabulary

- Restricted List of Terms

Taxonomy

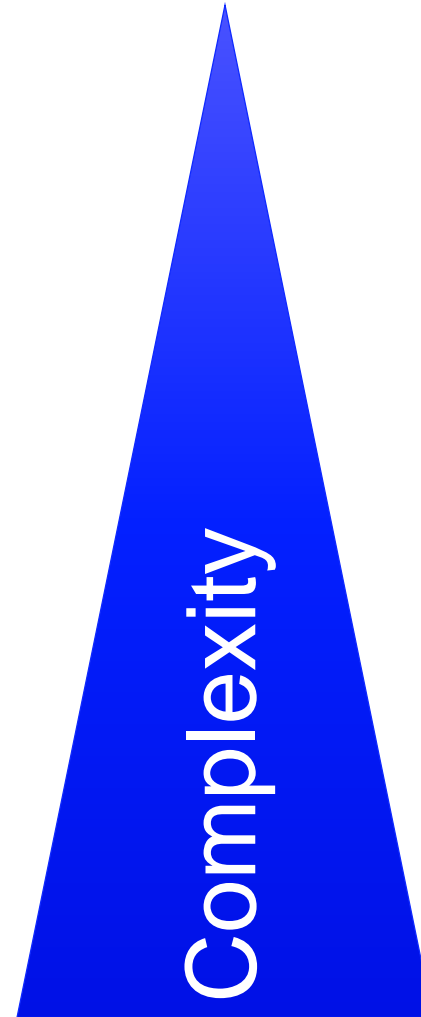
- Controlled Vocabulary
- + Hierarchical (Broader Term/Narrower Term)

Thesaurus

- Taxonomy
- + Equivalence (Use/Used for)
- + Associative Relationships (Related Terms)

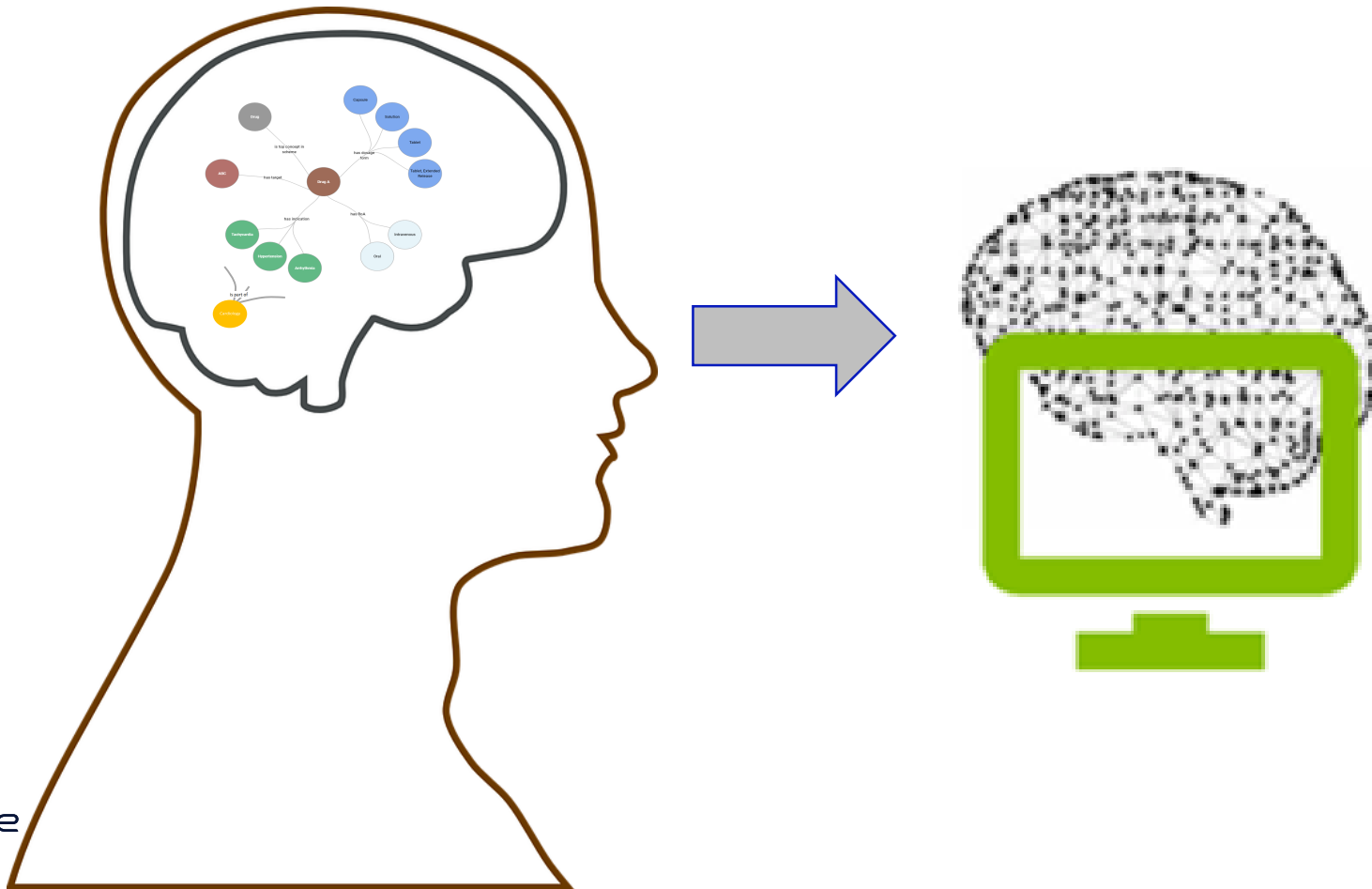
Ontology

- Thesaurus
- + Classes
- + Customized Relationships between Concepts
- + Relationship itself has meaning
- + Stored in a triple store
- => Captures domain knowledge



What is an ontology?

An ontology is a formal description of the knowledge within a domain, capturing concepts and relationships between them. Ontologies normalize terminologies, simplify search and enable content classification and knowledge extraction.



Content Sample

Apple's stock went up
when the new iPhone
was announced

Getting Context

CONTENT

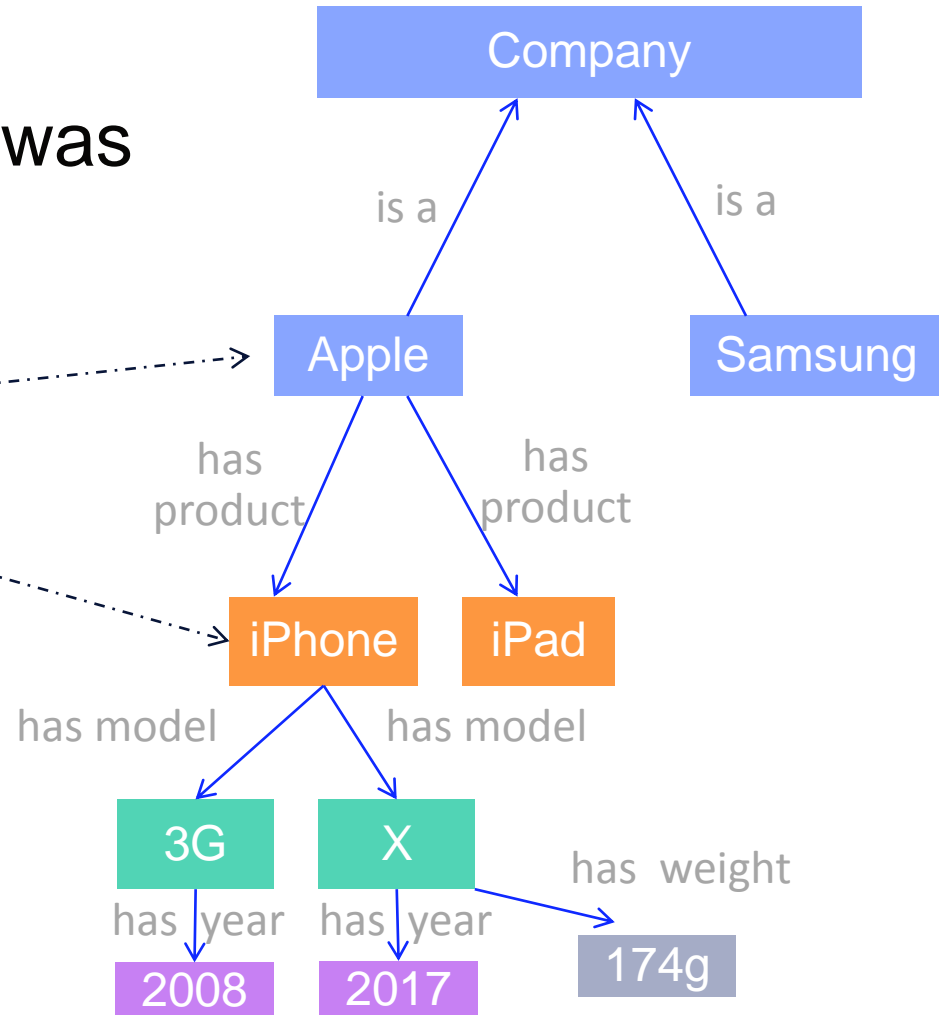
Apple's stock went up when the new iPhone was announced

Tags:

Company: Apple <URI>

Product: iPhone <URI>

ONTOLOGY



Benefits of Semantic Enrichment

- Improved searching
- Disambiguated terminology
- Content organization by topic groupings
- Integration of additional information
- Interoperability of different content sources
- Improved text analytics and graphical representation

Semantic Enrichment at AbbVie

Use Case:

Automatic, High Quality Indexing
for Therapeutic Area
Literature Databases

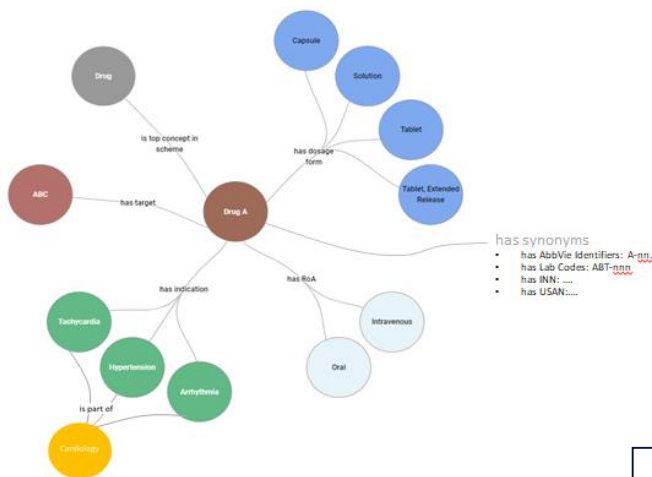


*Semantic enrichment is the
automatic or semiautomatic step
of **enriching** raw text with
ontology-based concepts, taking
the **content context** into account.*

Semantic Enrichment - Components



Content

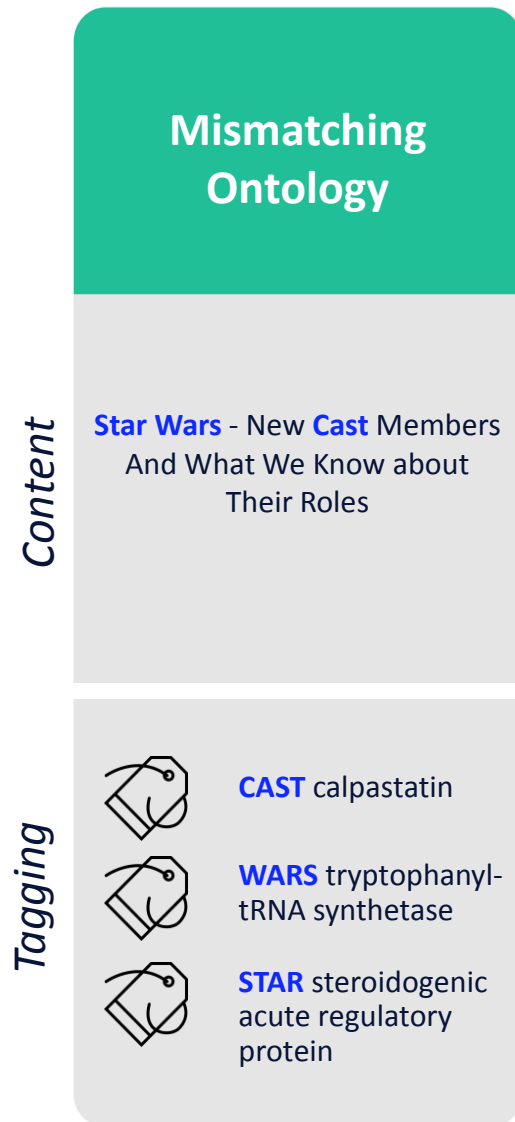


Ontology

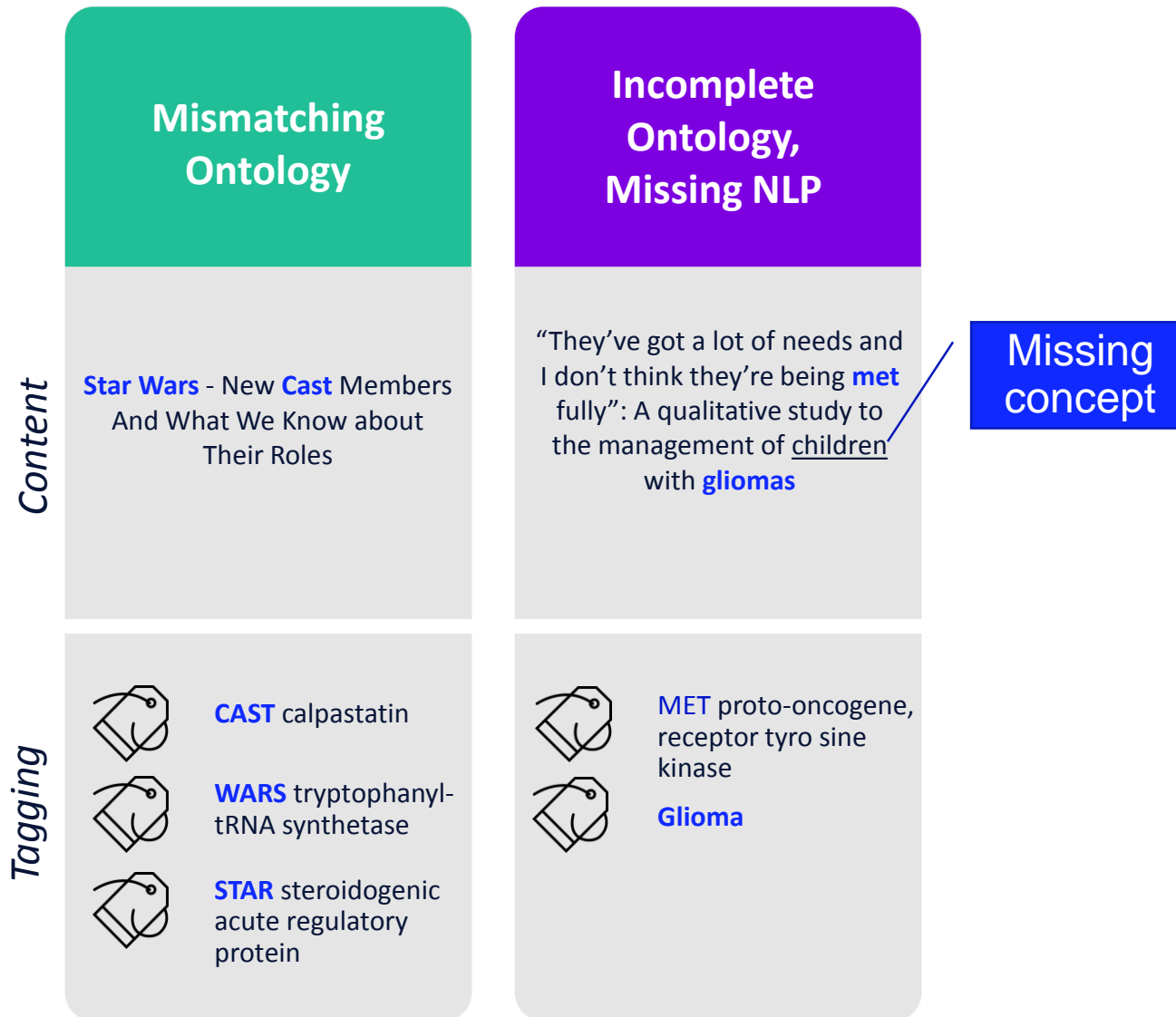
```
<!-- Evidence lookup -->
<combine label="{resou
  <!-- Phraselist - A
  <phraselist pos="0"
```

Rules Engine

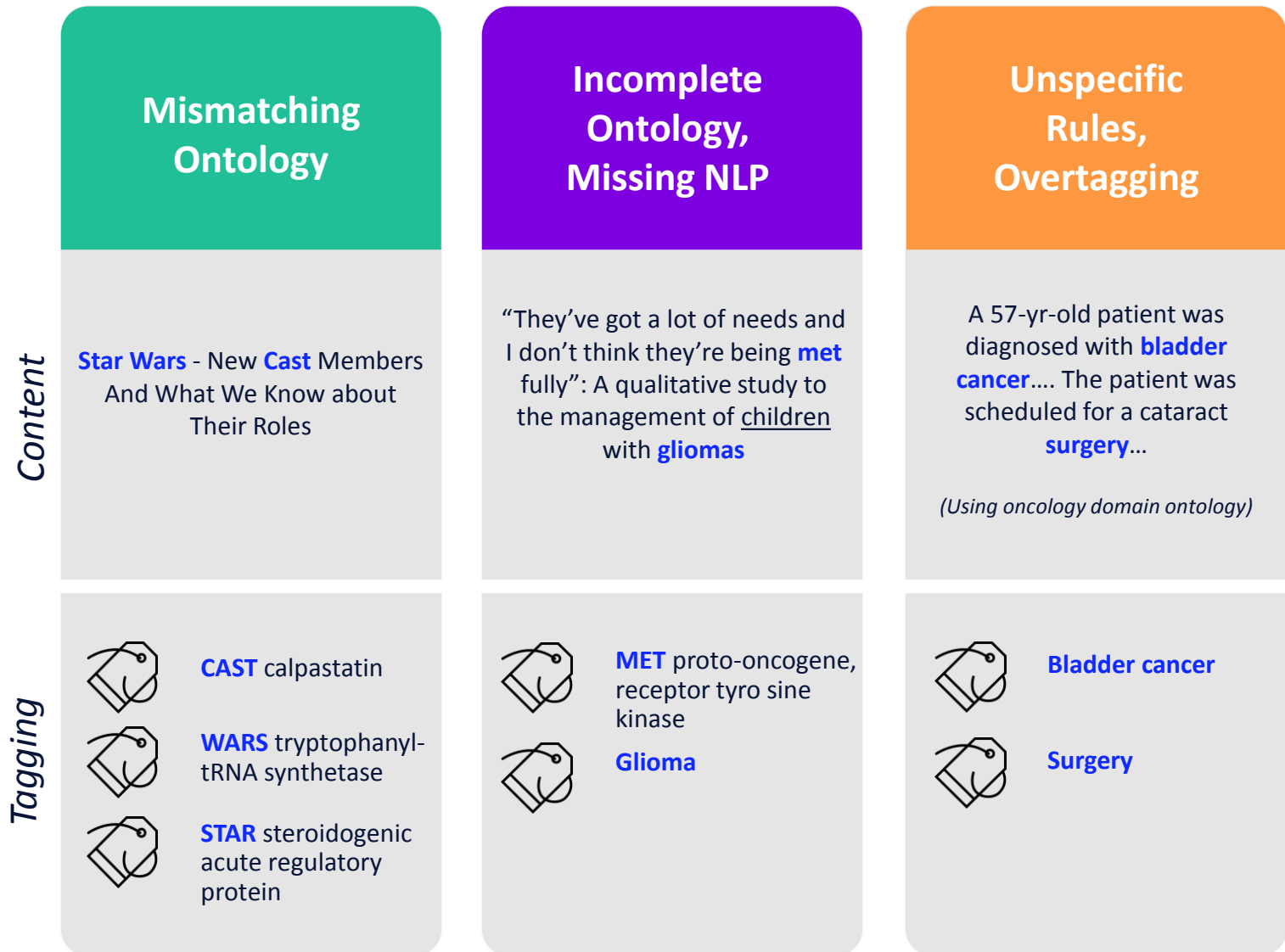
Semantic Enrichment - What can go wrong?



Semantic Enrichment - What can go wrong?



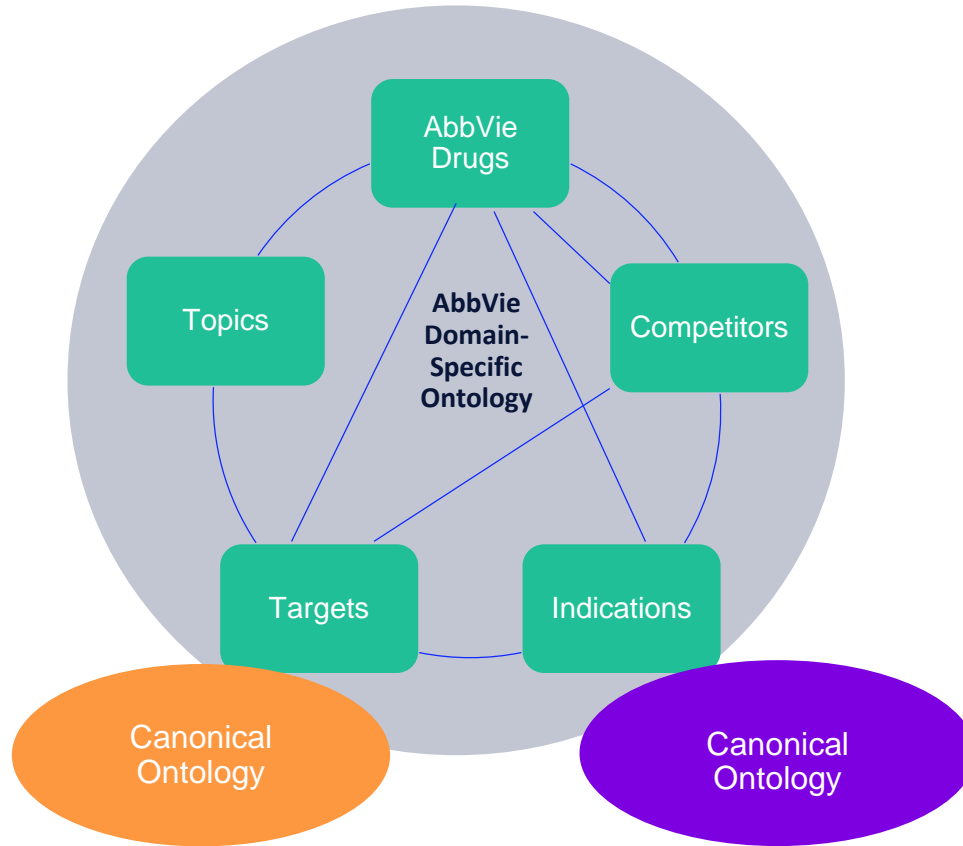
Semantic Enrichment - What can go wrong?



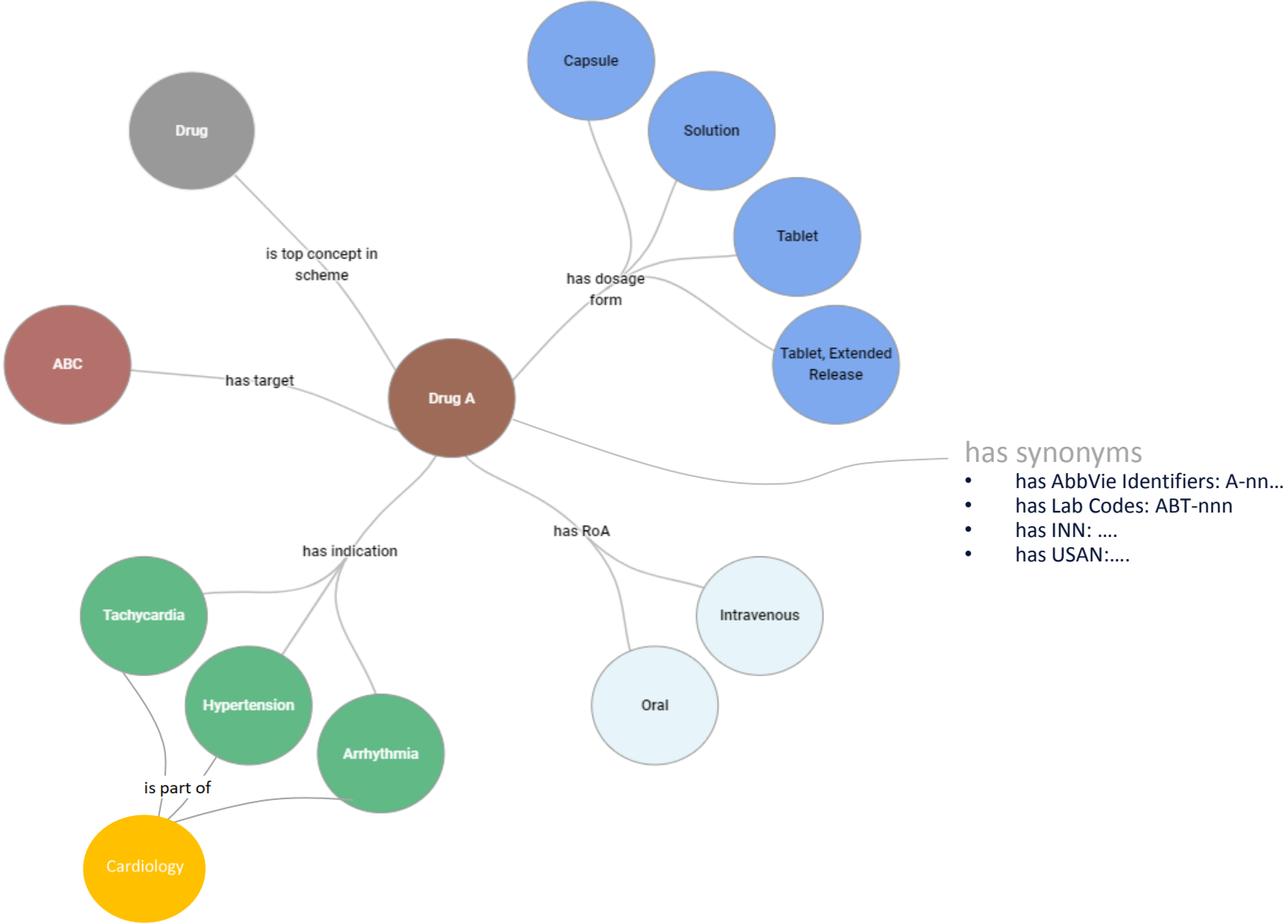
Building a Domain-Specific Ontology

- Determine the domain and scope
 - Which domain will the ontology cover?
 - What is the ontology used for?
 - Review existing articles
 - User interview - Which terminology do they use ?
- Identify existing canonical ontologies
- Build and enhance the domain/application-specific ontology
 - Determine the broad categories (semantic type)
 - Add the concepts and hierarchies
 - Define the properties and associative relationships
 - Define the concept types (classes)
 - Add synonyms or map ontologies
 - Review subject-relevant literature to identify additional concepts

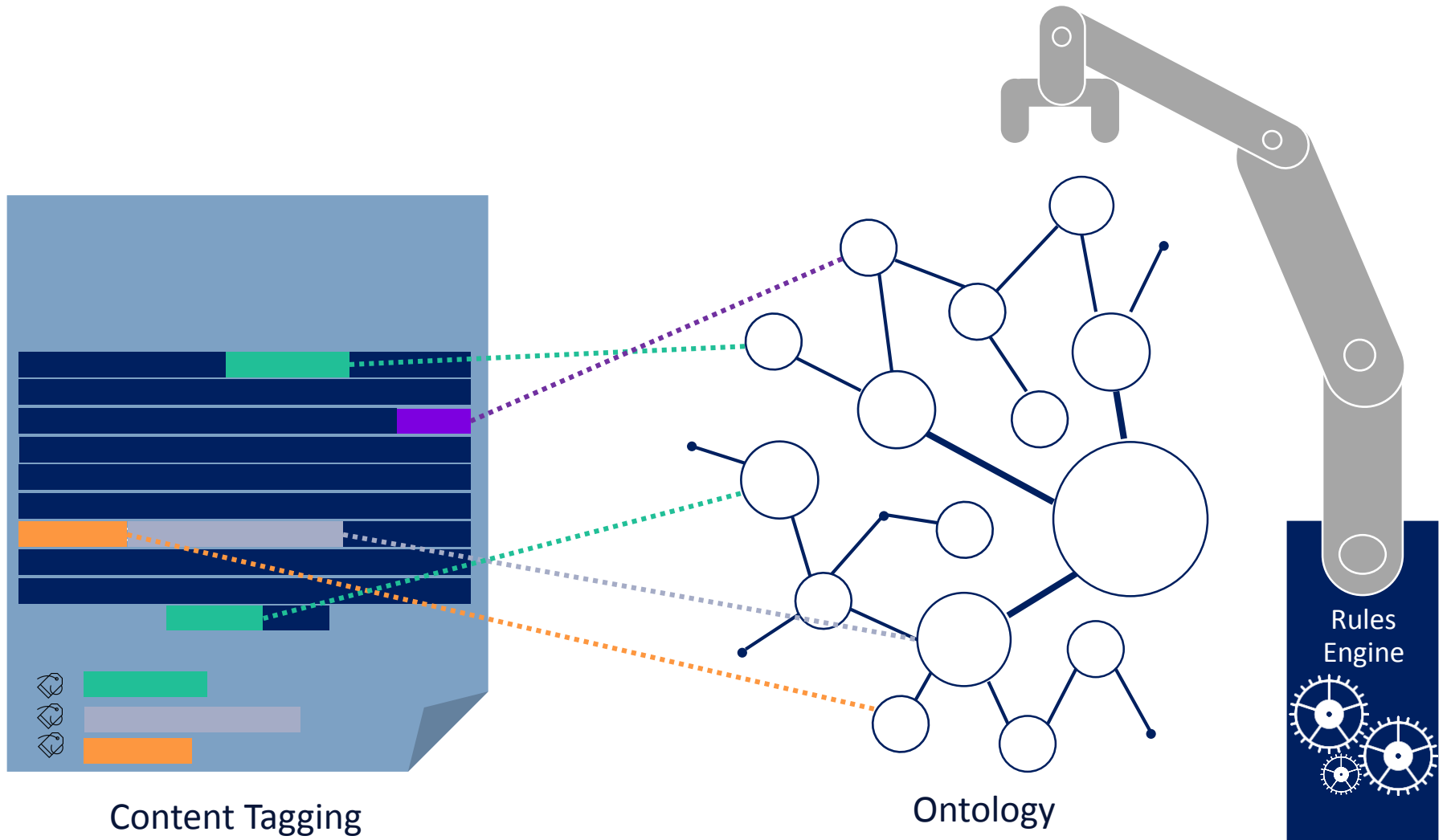
Building a Domain-Specific Ontology



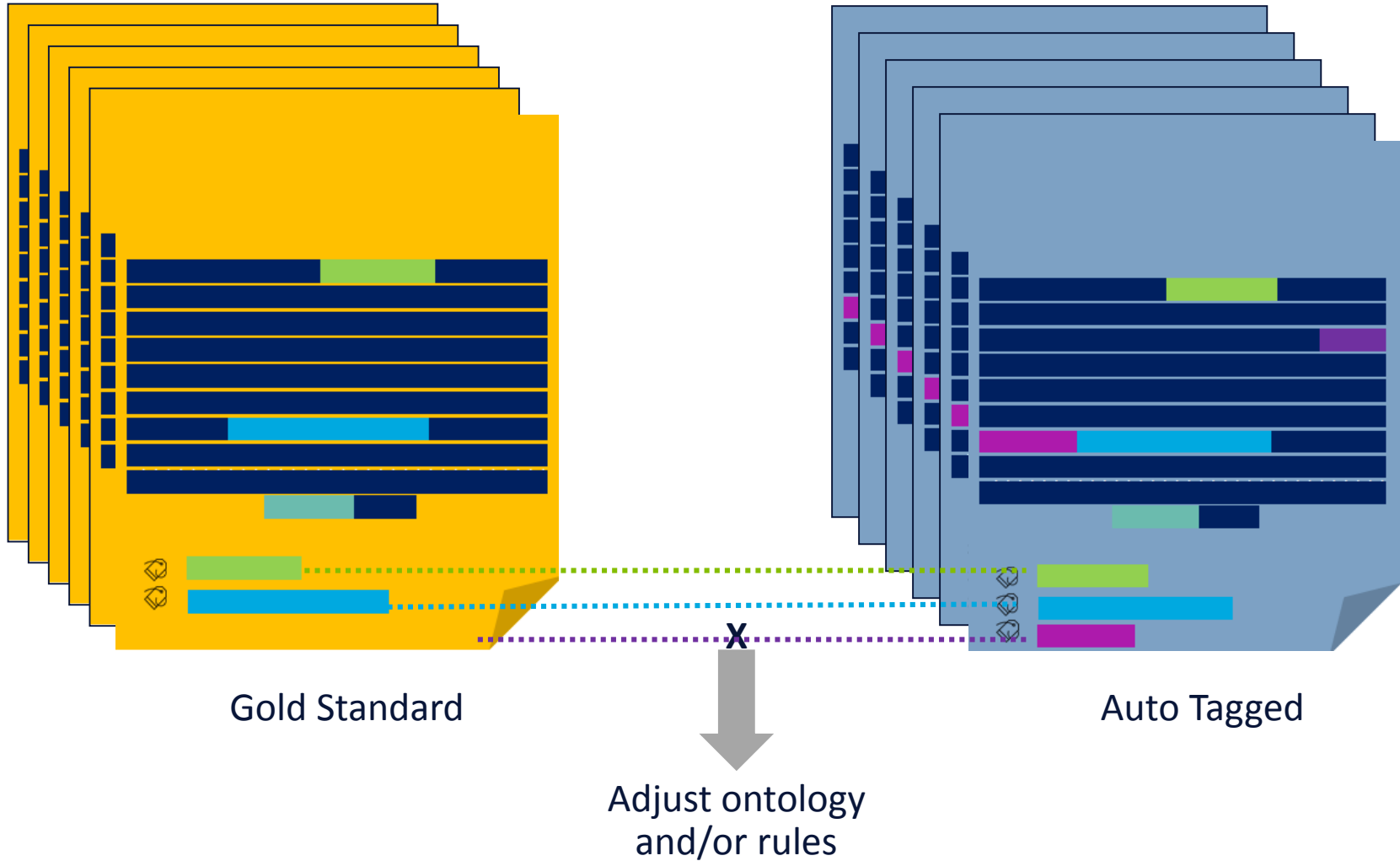
Drug Ontology Sample



Semantic Enrichment - Applying the Ontology



Semantic Enrichment - Quality Assessment



Semantic Enrichment - Value

