



Materials Informatics. An Ontology approach.

Lessons Learned from the medical domain ontologies

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About this talk

What we are talking about?

We are discussing about ontologies from the modern point of view to be applied in Material Science.

Here we will see a real-world app as a practical example of what we can do with a technological implementation of an ontology. Unfortunately, this example is on the health-care domain not in materials domain.

Why should we consider this use case?

Ontology is a complex field of study. It is hard to find practical examples of what ontology is (can be use) from the practical point of view.



Lessons learned from SNOMED-CT

SNOMED-CT (Clinical Terms) is a **systematically organized computer processable collection of **medical terms**** providing codes, terms, synonyms and definitions used in clinical documentation and reporting.

SNOMED CT provides for **consistent information interchange and is fundamental to an interoperable** electronic health record. It provides a consistent means to **index, store, retrieve, and aggregate clinical data** across specialties and sites of care. **This is perfectly exportable to the material science domain which is the goal of this workshop.**

The formal model underlying SNOMED-CT can be characterized as a **multilingual thesaurus with an ontological foundation**. SNOMED-CT is a class hierarchical ontology where concepts are aggregated and related with other concepts by using relationships included on the SNOMED-CT (Concept1 – Relationx – Concept2) **6369005 |Penicillin -class of antibiotic- (product)|**

Concept ID

Preferred Term

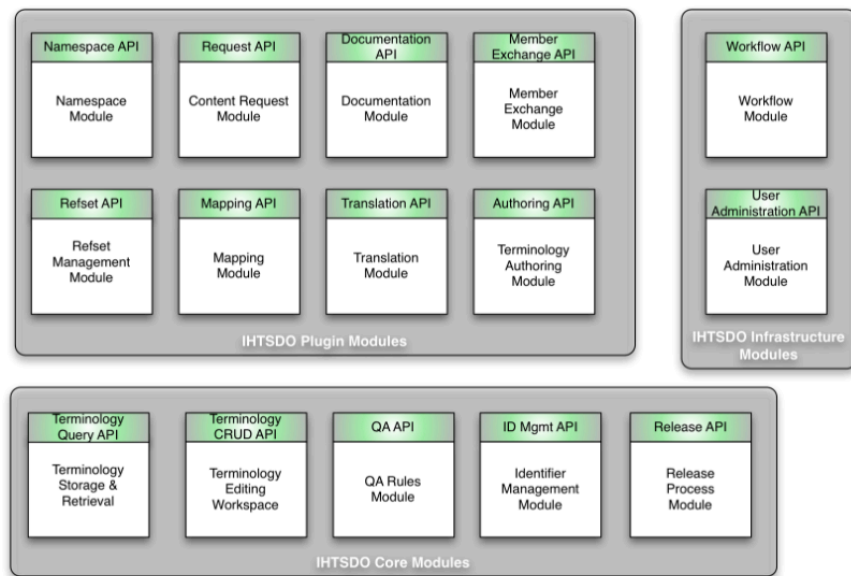
Taxonomy Parent

SNOMED-CT APIfied Ontology

SNOMED-CT isn't just a ontology or terminology.

The main aim of SNOMED-CT is been the core component of EHR. When a EHR is being build, clinical terms must be searched (in the form of complex queries), correlated and, at the end, what we are looking for is a so-called Decision Support System (CDS) just like in material science.

That is why, SNOMED-CT is more than a terminology. **SNOMED-CT has been developed a technological product.** It brings with a **No-SQL (document-like) Database for storage, and API for queries abstractions and some user interfaces and code-examples for terms or concepts searches.**



What can we re-use from SNOMED-CT tech implementation?

Elements of SNOMED-CT Standar Browser:

- Taxonomy explorer
- Concept/term browser
- Search engine
- Filter functionalities
- Release and Data Base selection
- Formal Grammar explorer
- Tech pieces (Backend + APIs)

SNOMED International SNOMED CT Browser

Release: International Edition 20180131 | Perspective: Full | Feedback | About

Taxonomy | Search | Favorites | Reset

Taxonomy

Stated view | Descendants Count: Off

- SNOMED CT Concept
 - Body structure (body structure)
 - Clinical finding (finding)
 - Environment or geographical location (environment / location)
 - Event (event)
 - Observable entity (observable entity)
 - Organism (organism)
 - Pharmaceutical / biologic product (product)
 - Physical force (physical force)
 - Physical object (physical object)
 - Procedure (procedure)
 - Qualifier value (qualifier value)
 - Record artifact (record artifact)
 - Situation with explicit context (situation)
 - SNOMED CT Model Component (metadata)
 - Social context (social concept)
 - Special concept (special concept)
 - Specimen (specimen)
 - Staging and scales (staging scale)
 - Substance (substance)

Concept Details | Expression Constraint Queries

Concept Details

Summary | Details | Diagram | Expression | Refsets | Members | References

Stated | Inferred

Parents

- Craniofacial pain (finding)

Headache (finding) | Star icon | User icon | Link: Finding site → Head structure

SCTID: 25064002
25064002 | Headache (finding) |

- en Headache
- en Head pain
- en Cephalalgia
- en Cephalgia
- en Cephalodynia
- en Headache (finding)
- en HA - Headache
- en Pain in head

Children (36)

36 Children



SNOMED-CT

DEMO TIME

