Ontologies and Metadata

INFO6540

Week 4 - Jan 30, 2018

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Questions?

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Week 2 lab - Part 2

- February 6, after the guest lecture by Dr. Finlay Maguire
- GitHub tutorial using a GUI
- We will use GitKraken
- Before the lab, go to https://www.gitkraken.com/ and install it
- Links to tutorials for GitKraken have been added to Brightspace (Week 2)

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Week 3

- Data visualization
  - Type of data
  - Intent
  - Audience

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DMP Tool

[Data Management Planning tool (https://dmptool.org/)](https://dmptool.org/)

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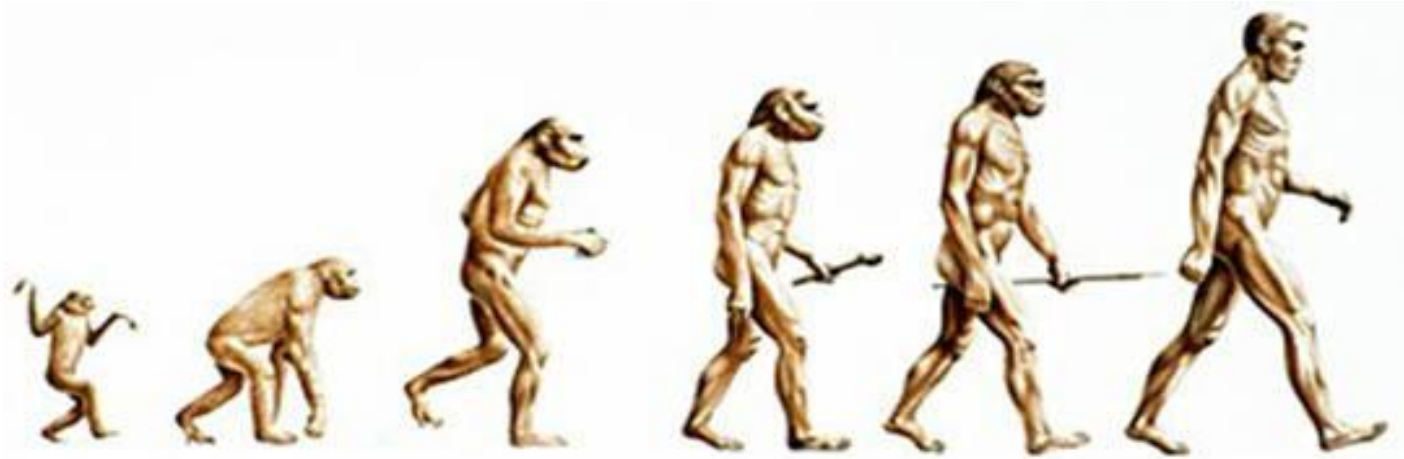
What is an ontology?

Onto-: from the Greek «ων» = being

-logy: from the Greek «-λογία» = study, science

A formal naming and definition of entities and the relationships between them, that exist for a particular domain.



TERMS

LIST OF TERMS

CONTROLLED VOCABULARY

DICTIONARY

THESAURUS

ONTOLOGY

Topalis, 2013

Visualization

Using graphics to climb the Data – Information – Knowledge – Wisdom hierarchy.

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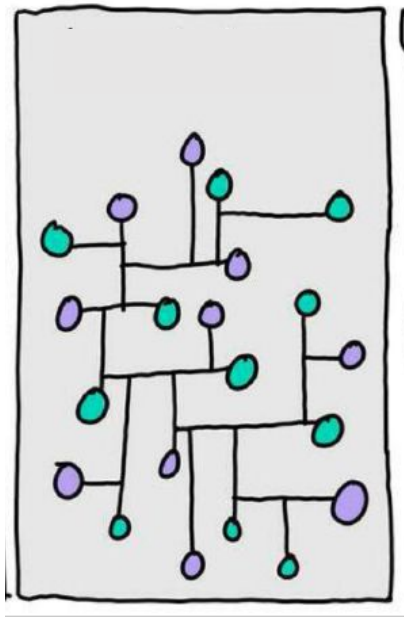
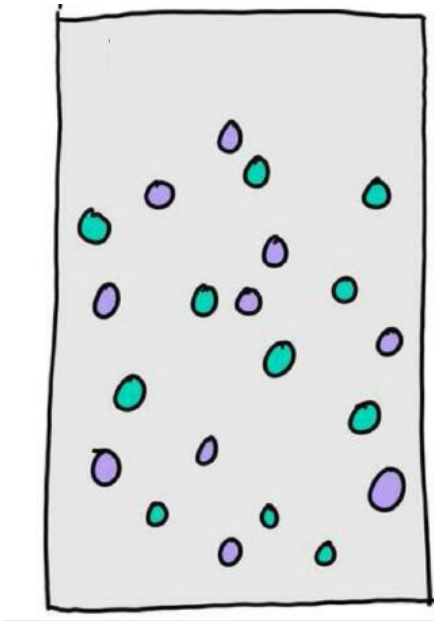
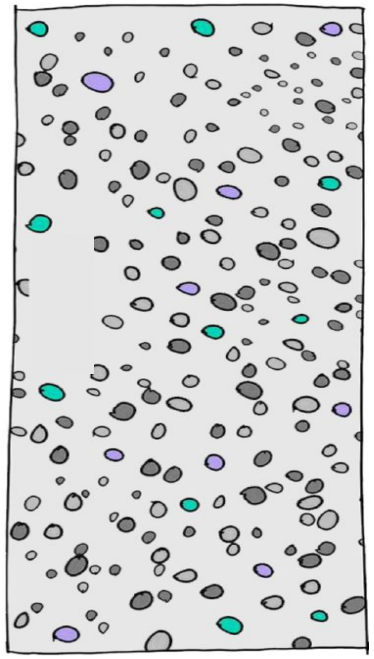
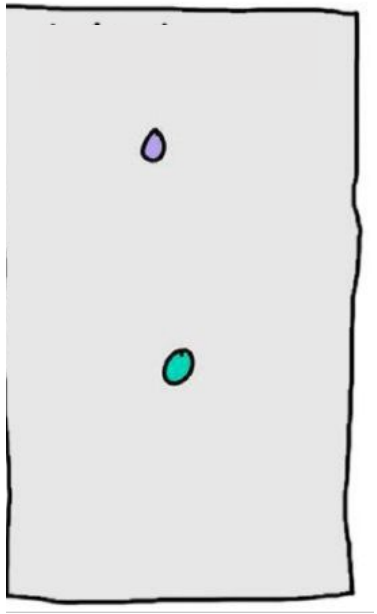
Visualization









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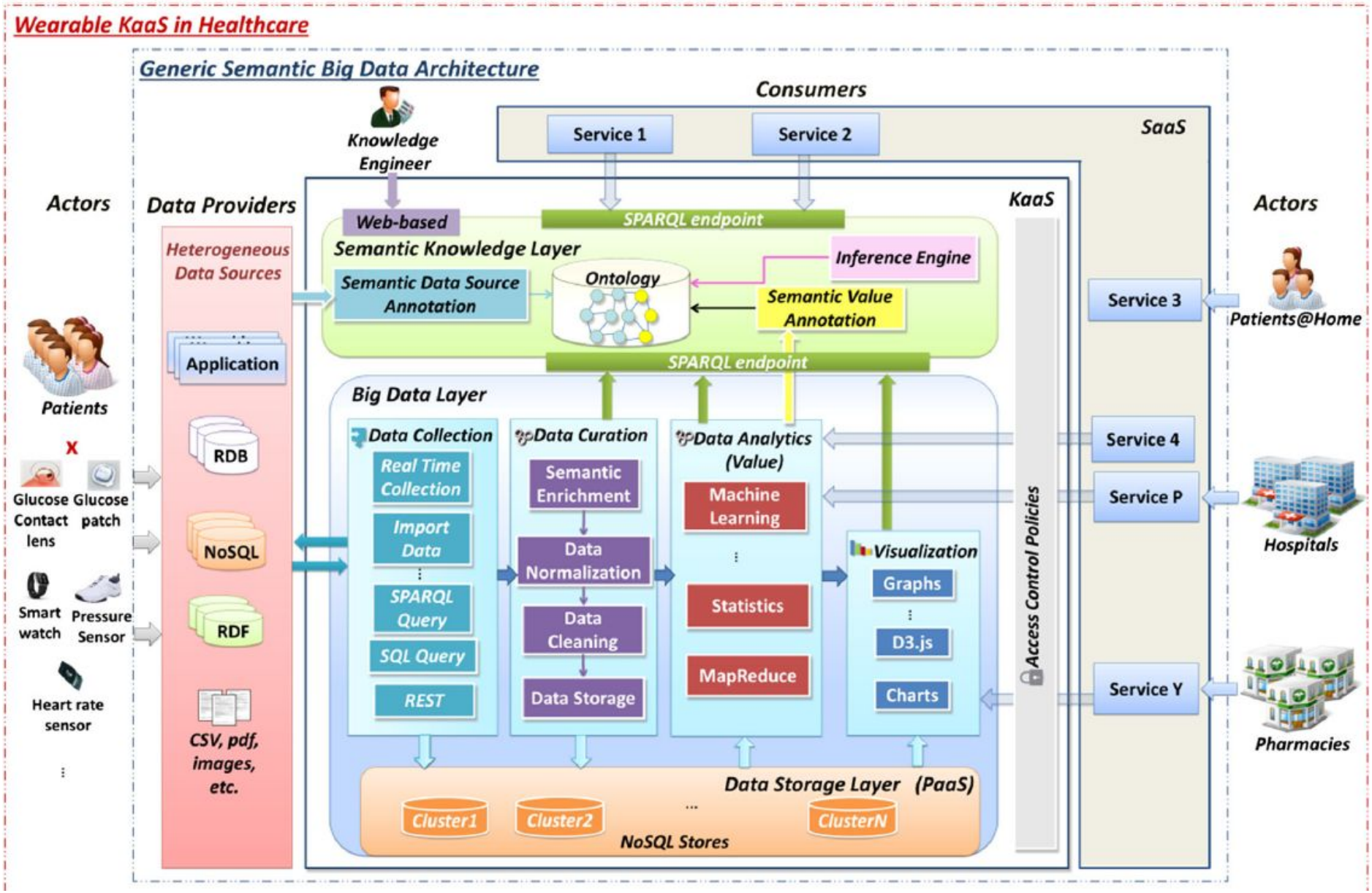

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Mezghani, Emna & Exposito, Ernesto & Drira, Khalil & Silveira, Marcos & Pruski, Cédric. (2015). A Semantic Big Data Platform for Integrating Heterogeneous Wearable Data in Healthcare. Journal of Medical Systems.

I THINK I SPEAK FOR EVERYONE HERE WHEN I SAY

HUH?

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Information Architecture

http://bourdagechiropractic.com/

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How do you make sense of things?

Understand the meaning

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http://www.thinkglink.com/

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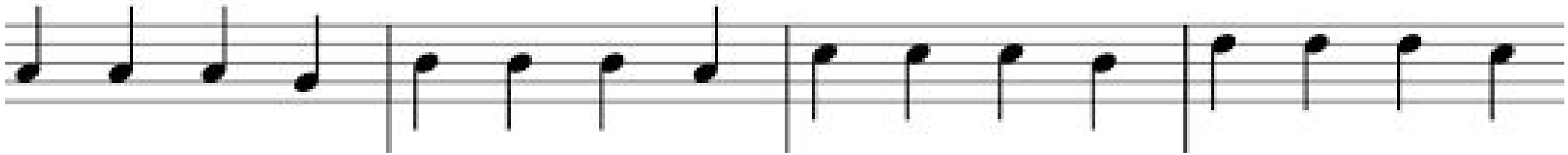

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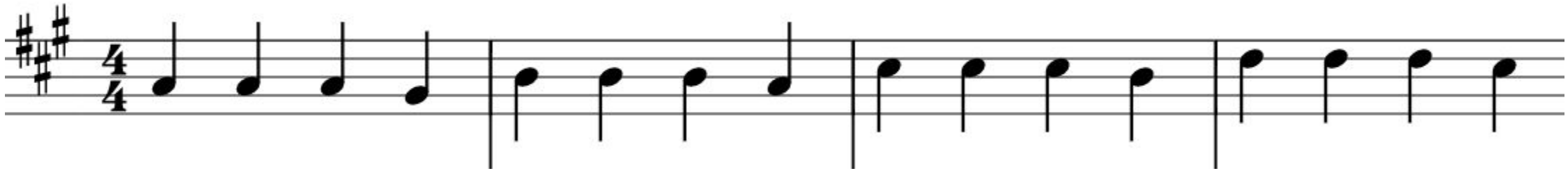

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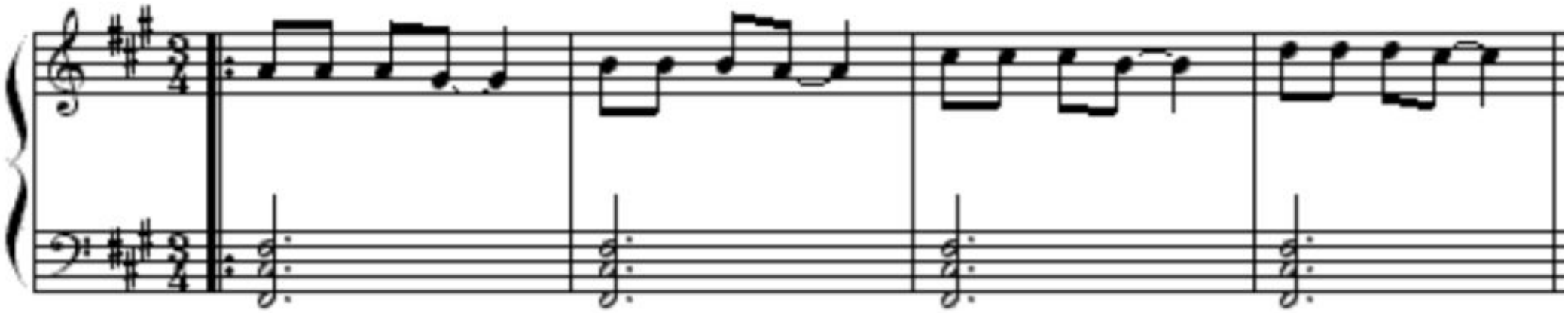
Within Temptation

1

What Have You Done



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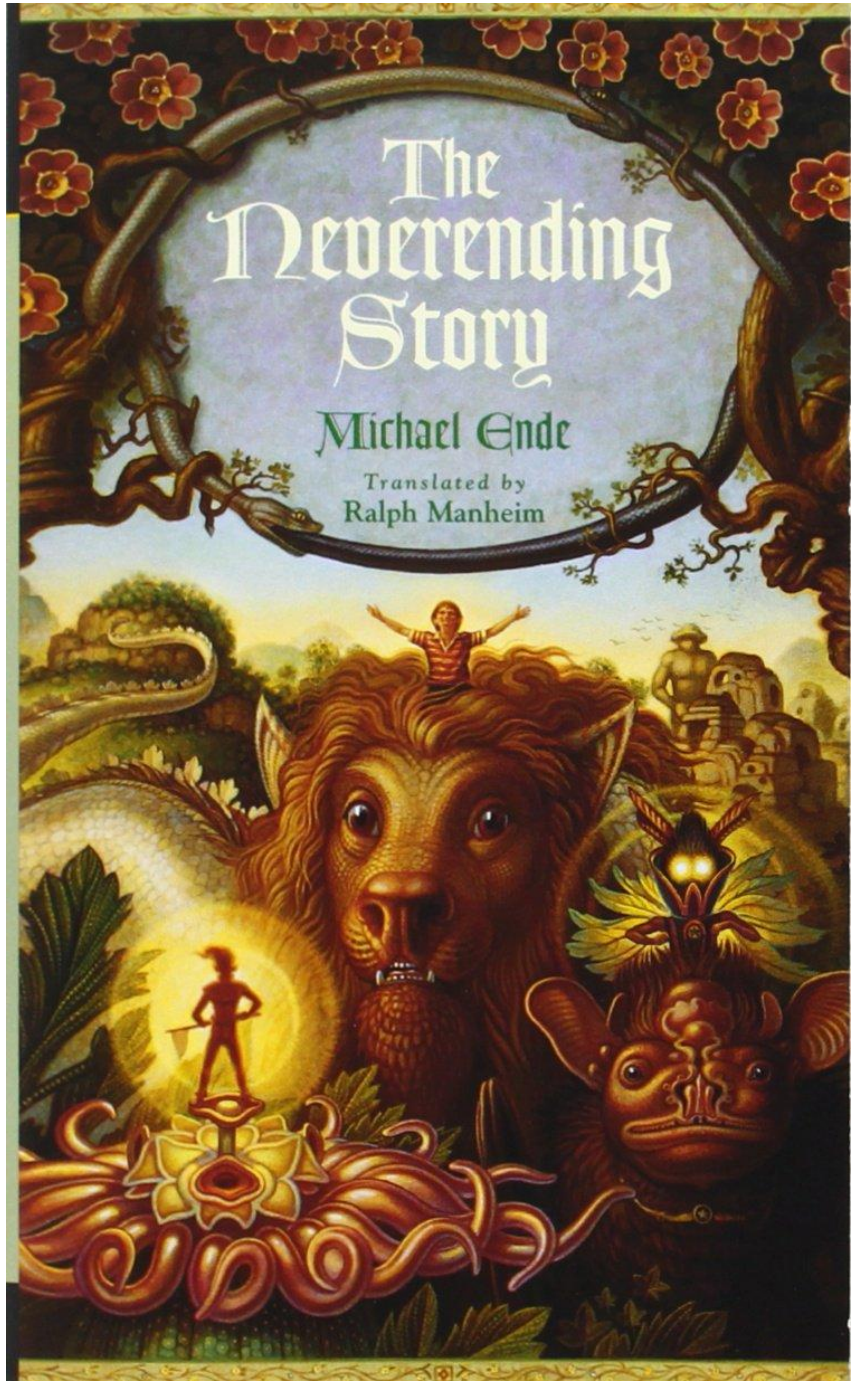

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What’s in a name...

Author	Writer
Book	Novel
Illustrated	Graphic
Illustrator	Artist
Issue	Volume
Journal	Magazine

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Antigone?

https://en.wikipedia.org/wiki/Antigone_(disambiguation)

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Flapjack?

https://en.wikipedia.org/wiki/Flapjack

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Three types of Medata

- Descriptive: describes a resource for purposes such as discovery and identification.
- Structural: is about containers of data and indicates how compound objects are put together.
- Administrative: provides information to help manage a resource.

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Metadata

The three main types work together.

Elements	Values
Structural	Descriptive or administrative

Metadata example

	Structural	Descriptive
Title:		'Mad Men' Season 5 plot predictions
Description:		The two-hour premiere quickly answered lingering questions from season four.
		Administrative
Creator:		Lucas Shaw
Date:		26/03/2012
Type:		Article

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Do you want good search results?

https://www.ncbi.nlm.nih.gov/pubmed?term=ontology

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Richard Bachman

Author of:

- Rage
- The Long Walk
- Roadwork
- Running Man
- Thinner
- Regulator
- Blaze

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Stephen King hasPseudonym Richard Bachman

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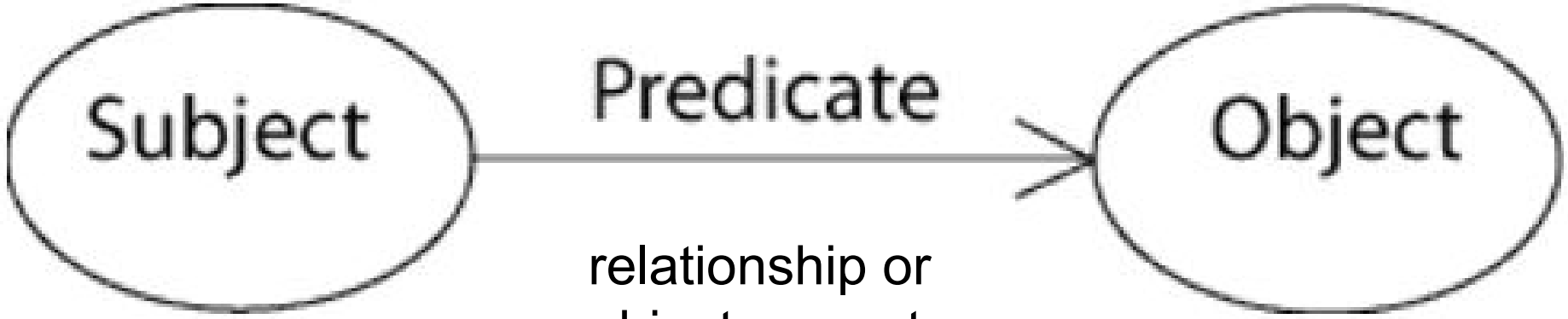
Graph data model

Stephen King hasPseudonym Richard Bachman



relationship or
object property

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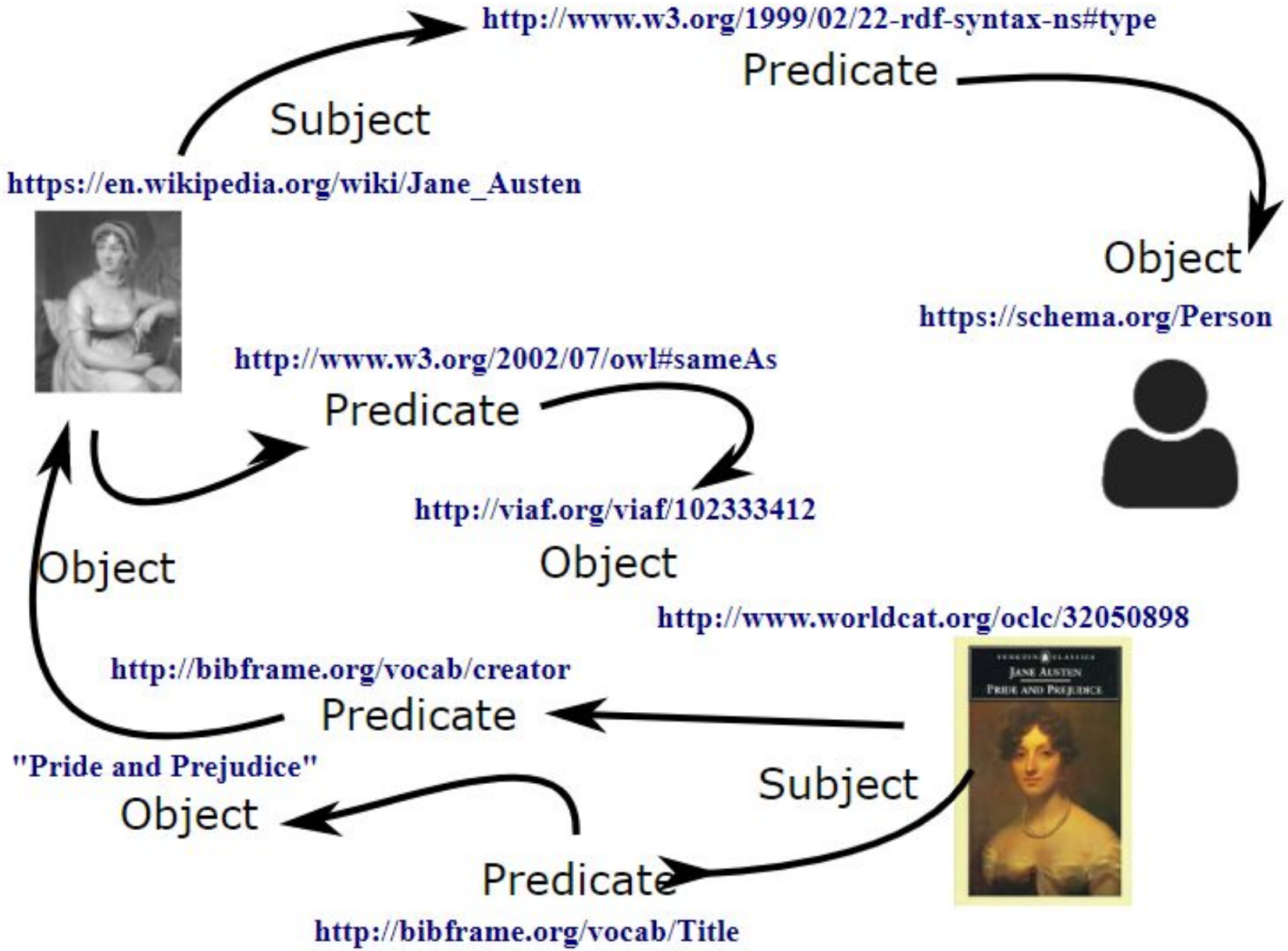

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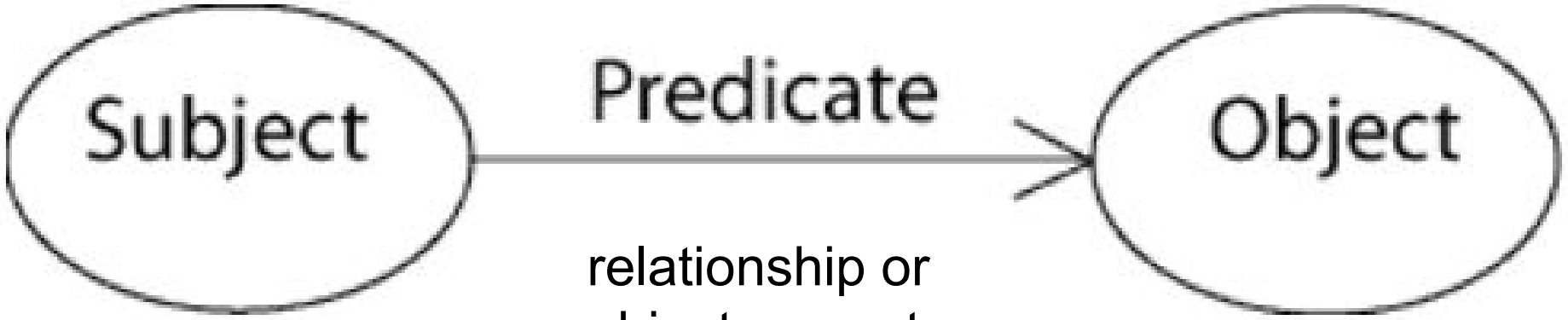
http://intro2libsys.info/calcon-2015/

RDF triple

That's how Ontologies are written!!!



relationship or object property

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Ontologies

Ontologies represent the knowledge of concepts and terms within a domain.

Ontologies: Do you know the meaning of what you are saying?

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(some) Parts of an ontology

- Terms (nodes, subject, object)
  - Unique ID
  - Definition
  - Synonyms
  - Additional metadata (Annotation Properties)

- Relationships between them (edges, Object Properties, predicate)
  - Unique ID
  - Definition

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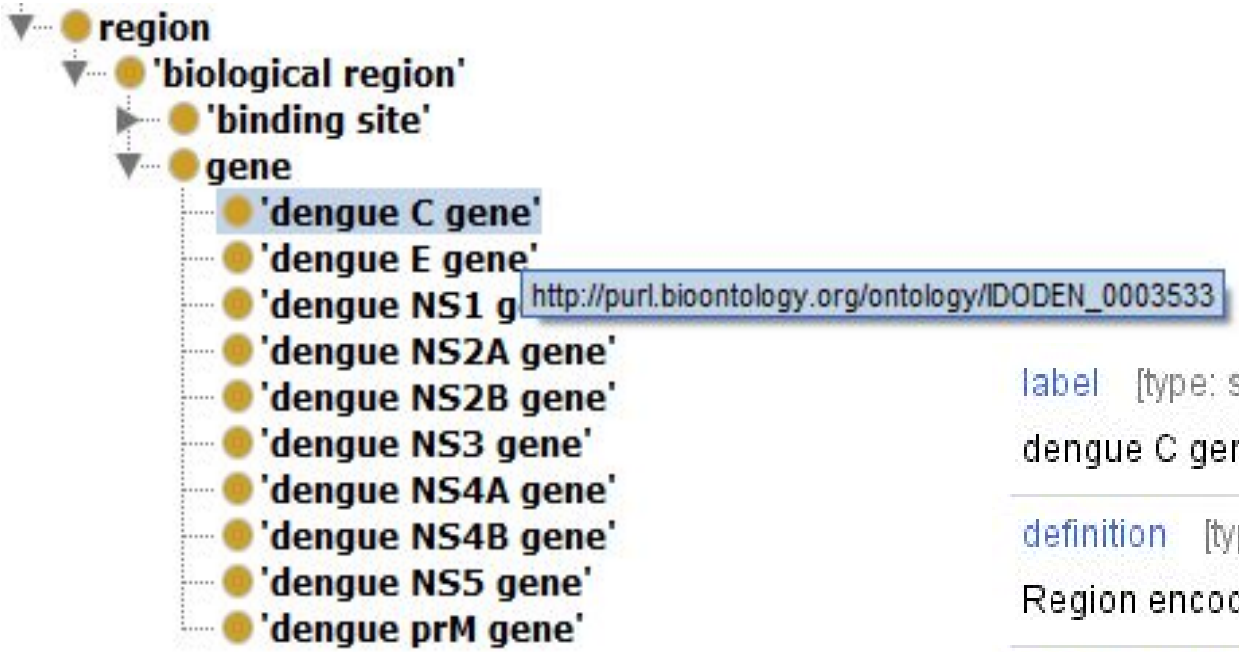

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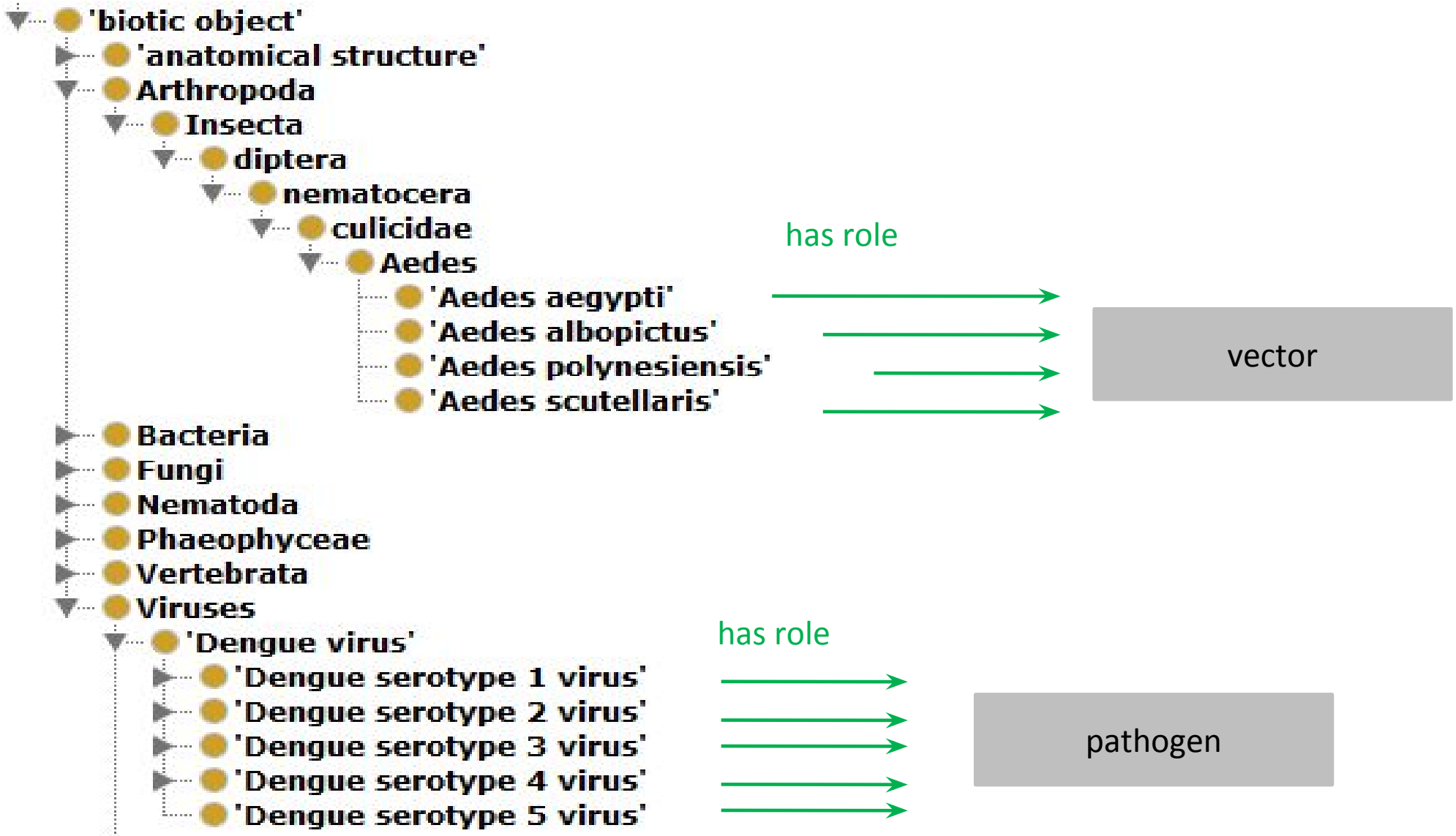
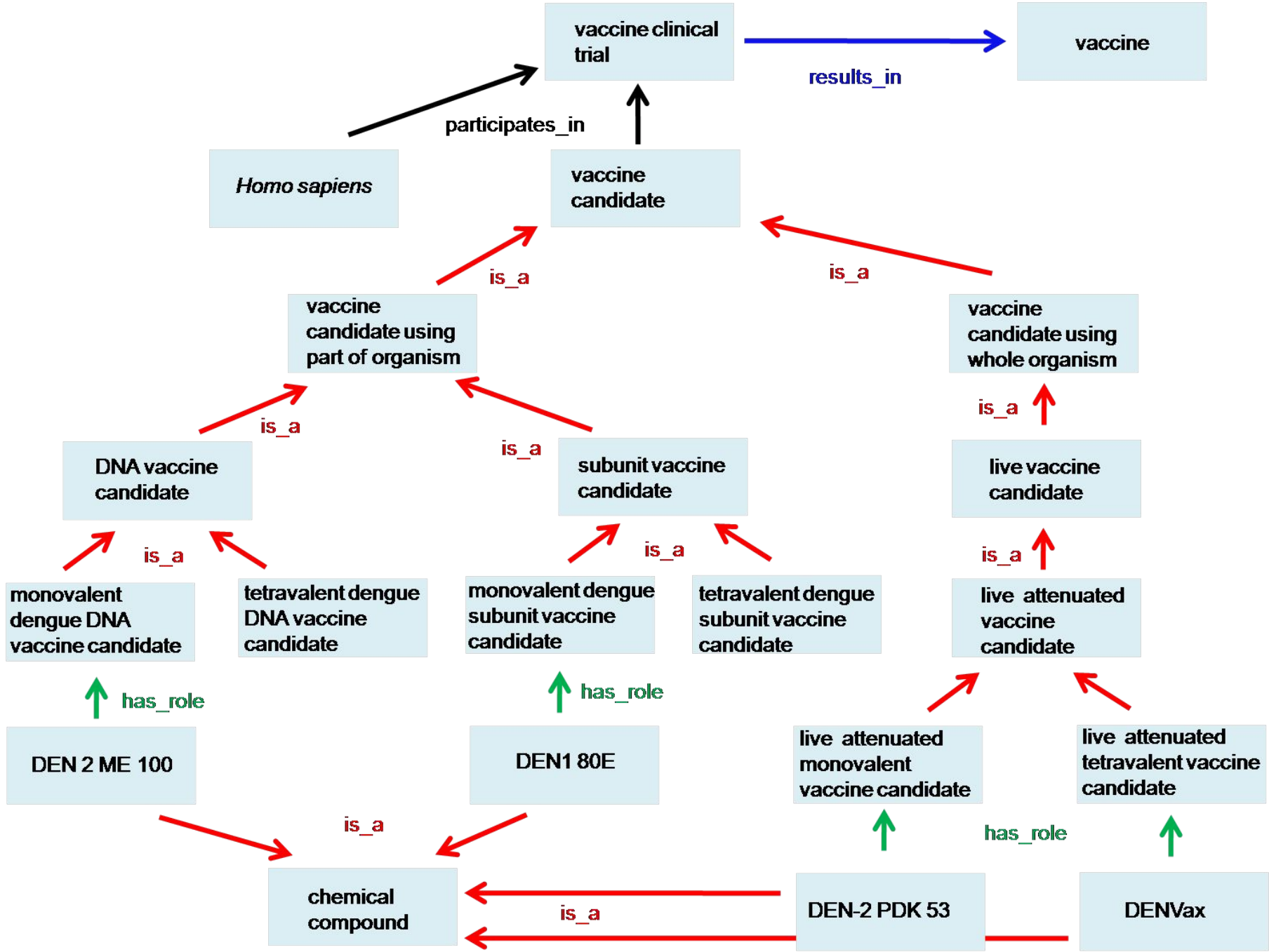
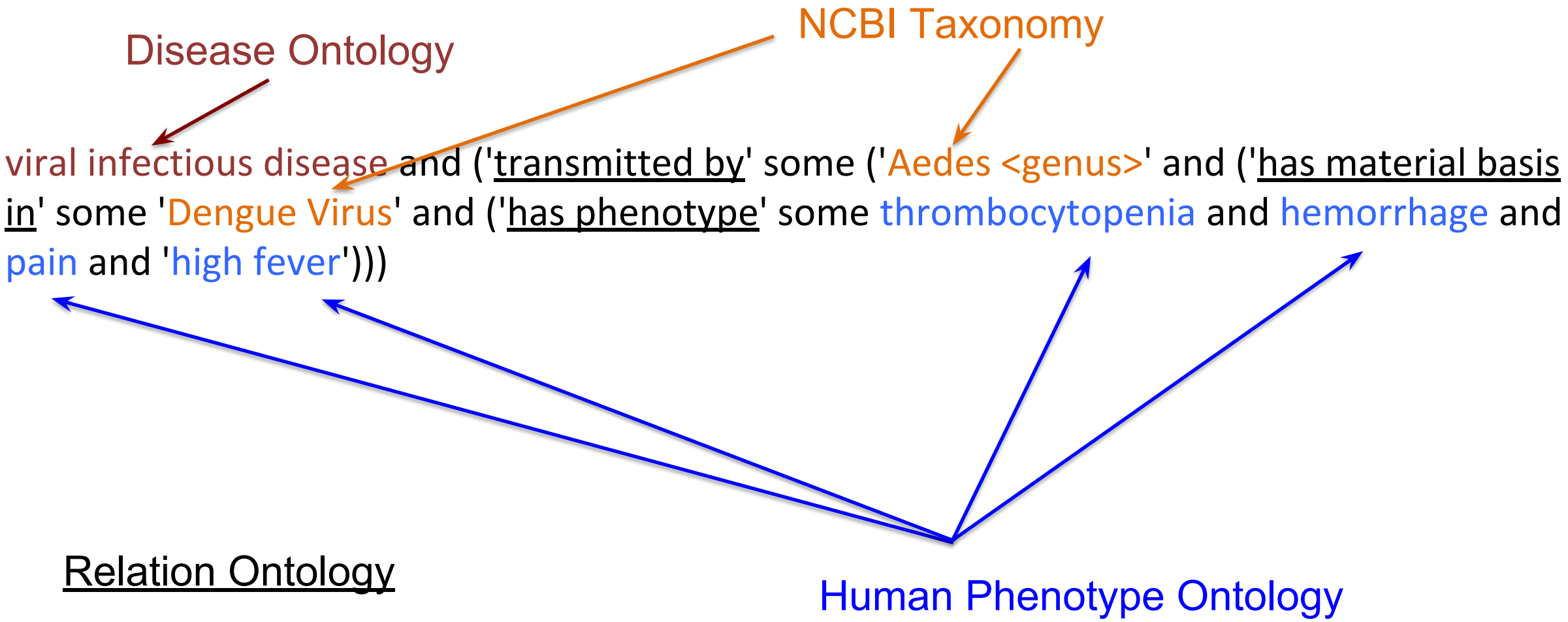
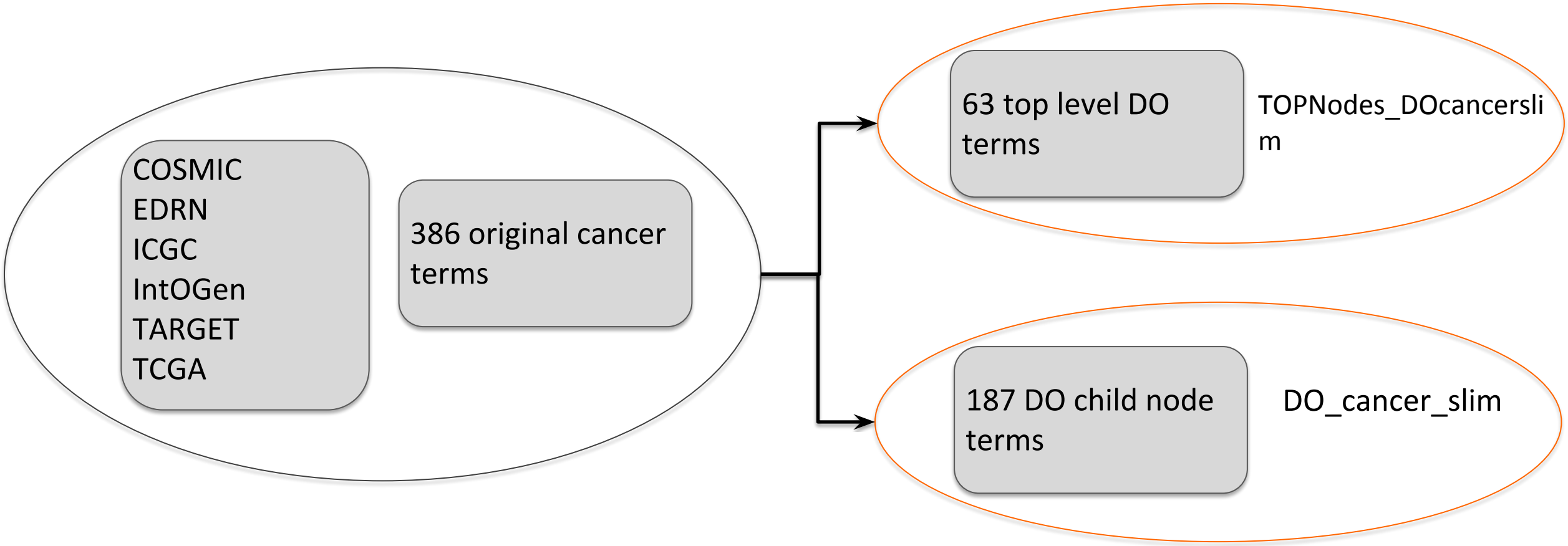

'biotic object'
'anatomical structure'
Arthropoda
Insecta
diptera
nematocera
culicidae
Aedes
'Aedes aegypti'
'Aedes albopictus'
'Aedes polynesiensis'
'Aedes scutellaris'
has role
vector
Bacteria
Fungi
Nematoda
Phaeophyceae
Vertebrata
Viruses
'Dengue virus'
'Dengue serotype 1 virus'
'Dengue serotype 2 virus'
'Dengue serotype 3 virus'
'Dengue serotype 4 virus'
'Dengue serotype 5 virus'
has role
pathogen


vaccine clinical trial
vaccine
results_in
participates_in
Homo sapiens
vaccine candidate
is_a
is_a
vaccine candidate using part of organism
vaccine candidate using whole organism
is_a
is_a
is_a
DNA vaccine candidate
subunit vaccine candidate
live vaccine candidate
is_a
is_a
is_a
monovalent dengue DNA vaccine candidate
tetravalent dengue DNA vaccine candidate
monovalent dengue subunit vaccine candidate
tetravalent dengue subunit vaccine candidate
live attenuated vaccine candidate
has_role
has_role
DEN 2 ME 100
DEN1 80E
live attenuated monovalent vaccine candidate
live attenuated tetravalent vaccine candidate
is_a
has_role
chemical compound
is_a
DEN-2 PDK 53
DENVax

Hemorrhagic dengue

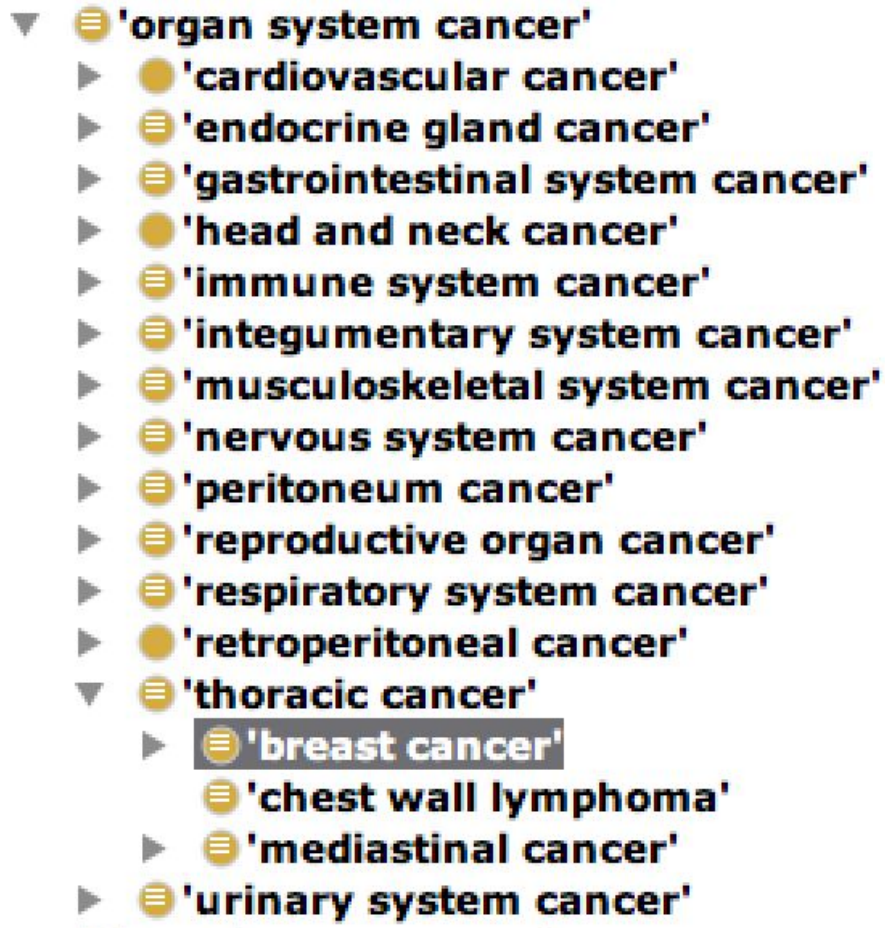


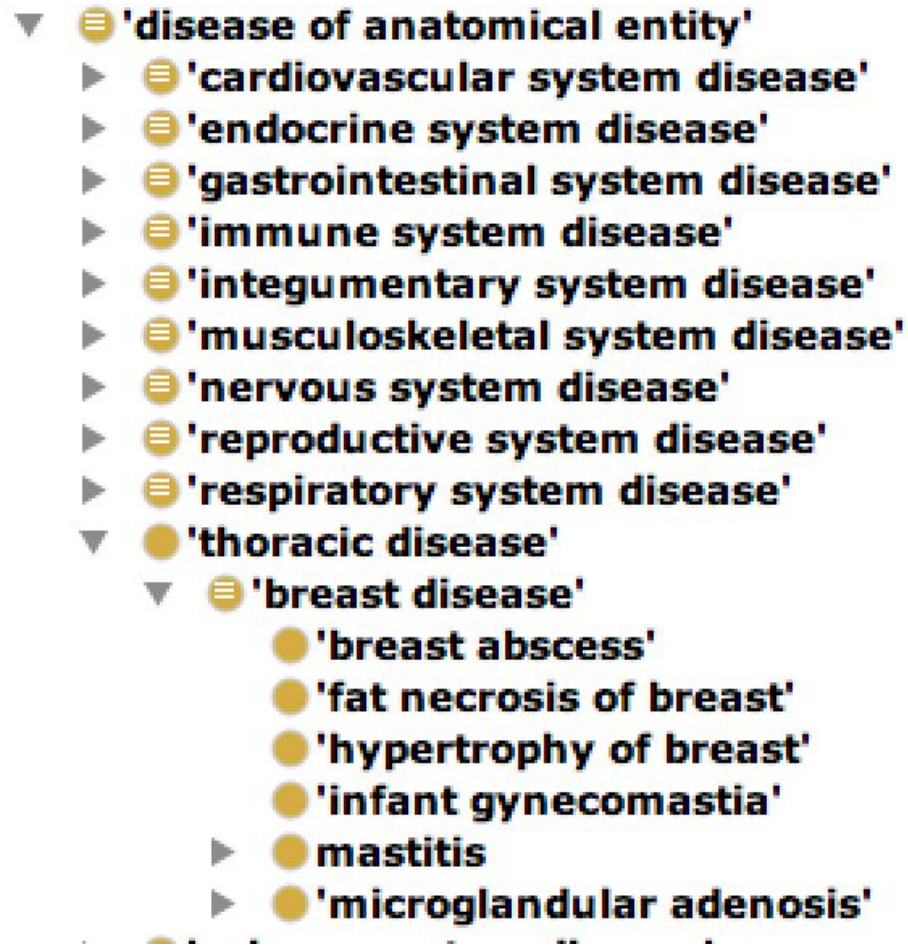
DO Cancer Project (v. 1.0)



TOP Node: DOID:10534 / stomach cancer

DO_cancer_slim term	Original_cancer_term	Source
DOID:10534 / stomach cancer	stomach	IntOGen
DOID:10534 / stomach cancer	stomach	EDRN
DOID:3717 / gastric adenocarcinoma	Stomach adenocarcinoma [STAD]	TCGA
DOID:3717 / gastric adenocarcinoma	stomach,NS,adenocarcinoma,NS	COSMIC
DOID:3717 / gastric adenocarcinoma	stomach,NS,carcinoma,adenocarcinoma	COSMIC
DOID:5579 / gastric gastrinoma	gastrointestinal_tract_(site_indeterminate), lymph_node,carcinoid-endocrine_tumour,gastrinoma	COSMIC
DOID:3717 / gastric adenocarcinoma	Gastric Cancer	ICGC


'organ system cancer'
'cardiovascular cancer'
'endocrine gland cancer'
'gastrointestinal system cancer'
'head and neck cancer'
'immune system cancer'
'integumentary system cancer'
'musculoskeletal system cancer'
'nervous system cancer'
'peritoneum cancer'
'reproductive organ cancer'
'respiratory system cancer'
'retroperitoneal cancer'
'thoracic cancer'
'breast cancer'
'chest wall lymphoma'
'mediastinal cancer'
'urinary system cancer'


'disease of anatomical entity'
'cardiovascular system disease'
'endocrine system disease'
'gastrointestinal system disease'
'immune system disease'
'integumentary system disease'
'musculoskeletal system disease'
'nervous system disease'
'reproductive system disease'
'respiratory system disease'
'thoracic disease'
'breast disease'
'breast abscess'
'fat necrosis of breast'
'hypertrophy of breast'
'infant gynecomastia'
mastitis
'microglandular adenosis'

Equivalent To

cancer
and ('located in' some breast)

SubClass Of

'thoracic cancer'

'breast disease'

SubClass Of (Anonymous Ancestor)

cancer
and ('located in' some 'anatomical system')

cancer
and ('located in' some 'thoracic segment of trunk')

disease
and ('located in' some breast)

protégé