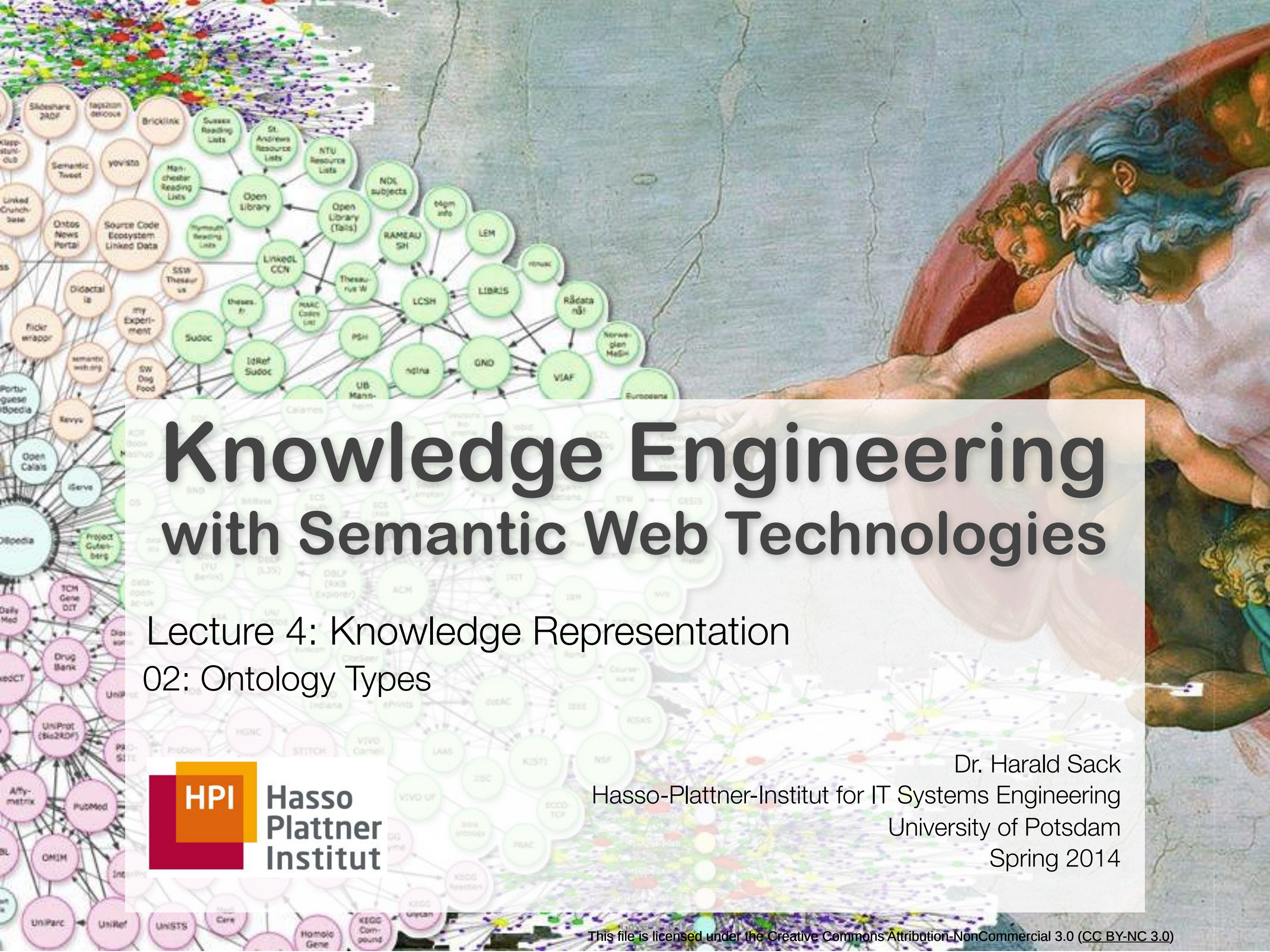


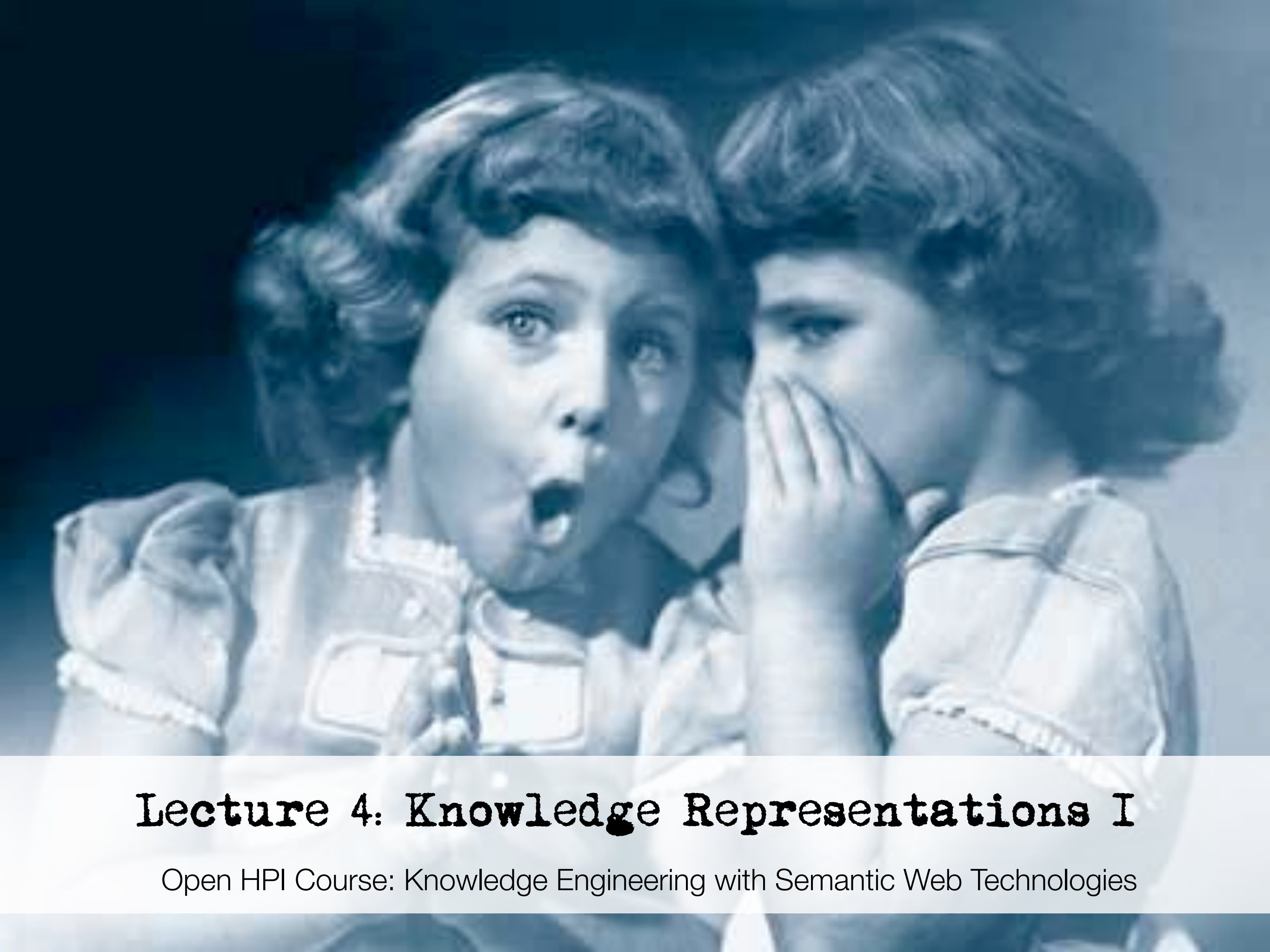


Knowledge Engineering with Semantic Web Technologies

Lecture 4: Knowledge Representation 02: Ontology Types



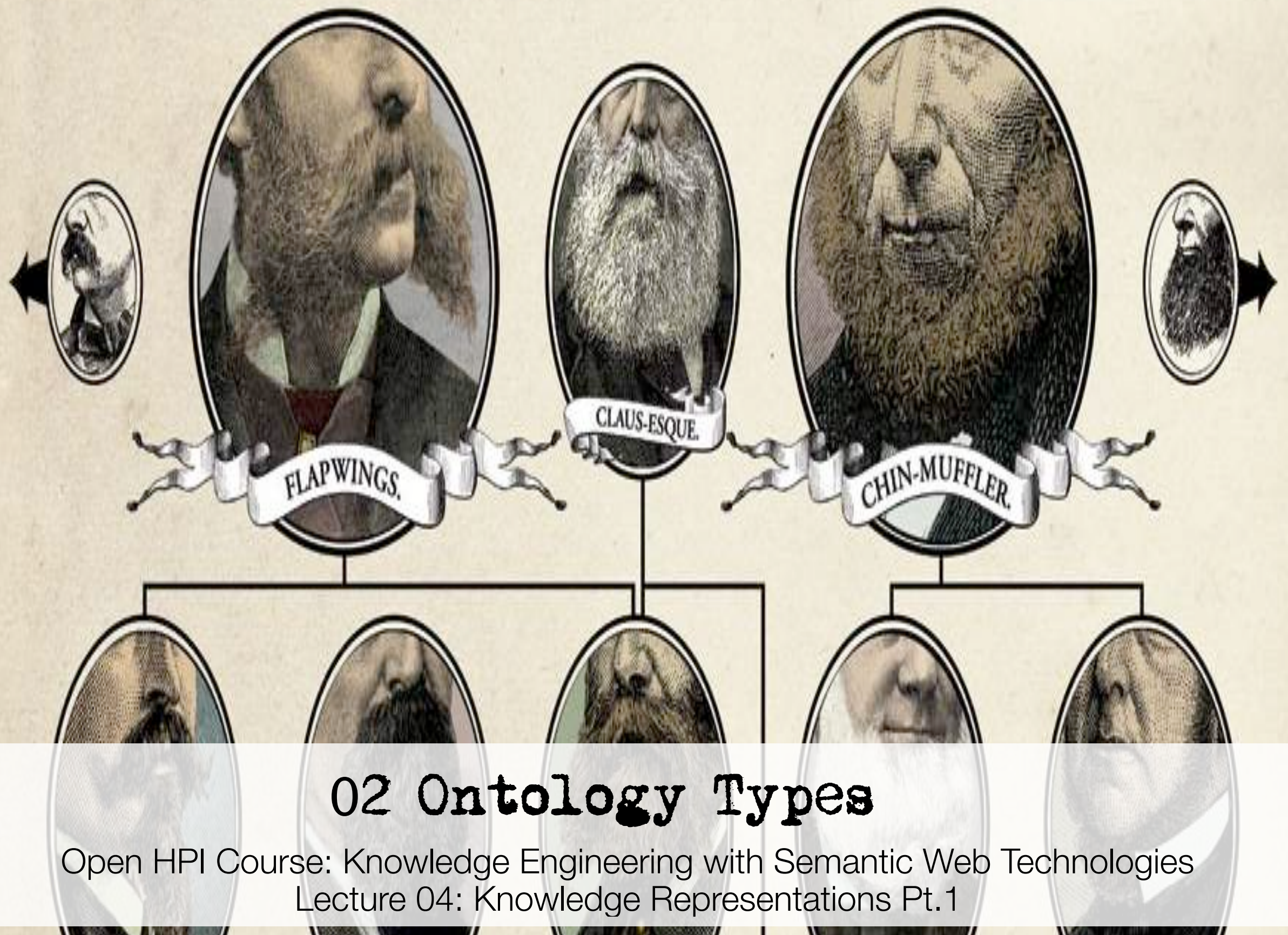
Dr. Harald Sack
Hasso-Plattner-Institut for IT Systems Engineering
University of Potsdam
Spring 2014



Lecture 4: Knowledge Representations I

Open HPI Course: Knowledge Engineering with Semantic Web Technologies

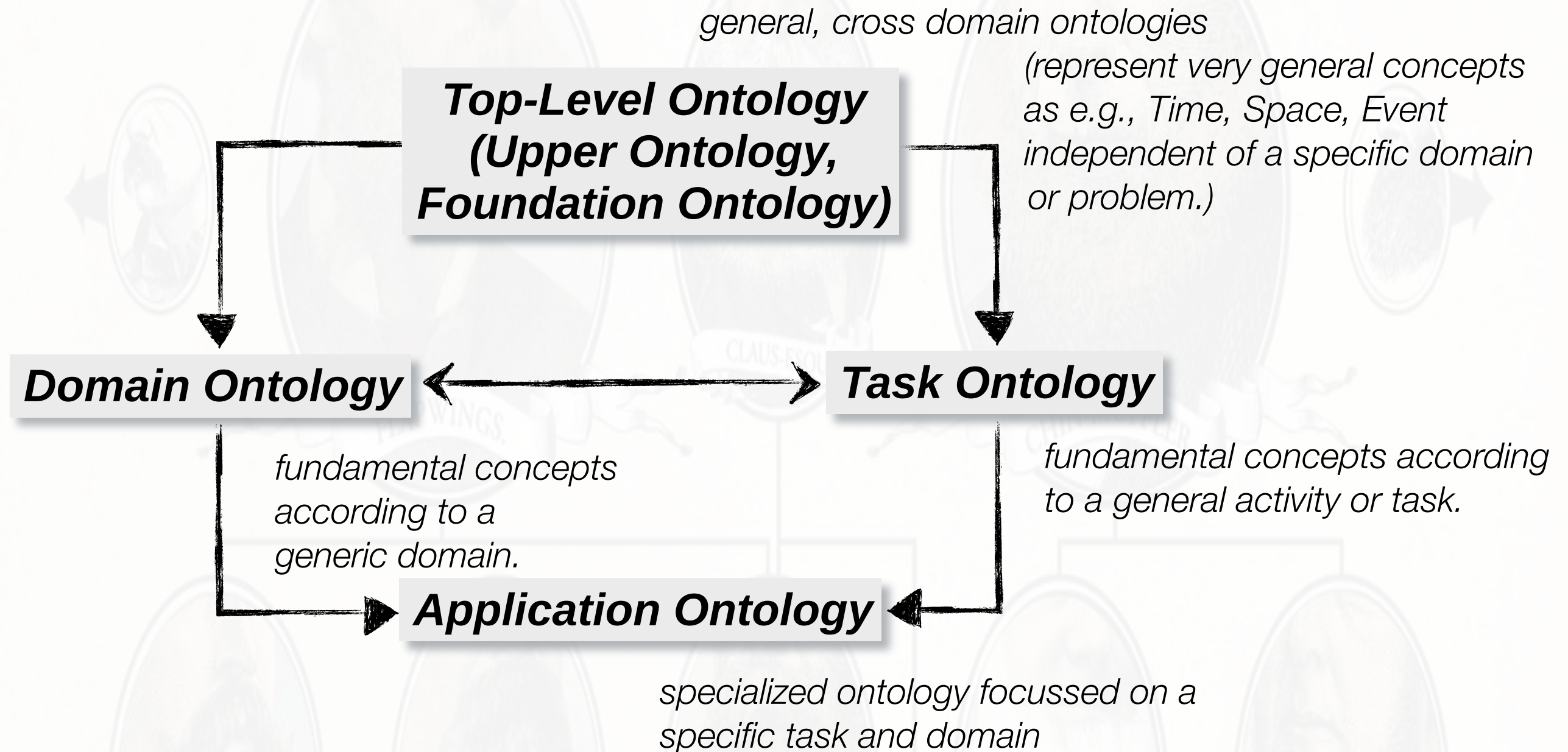
HIERARCHY OF BEARDS.



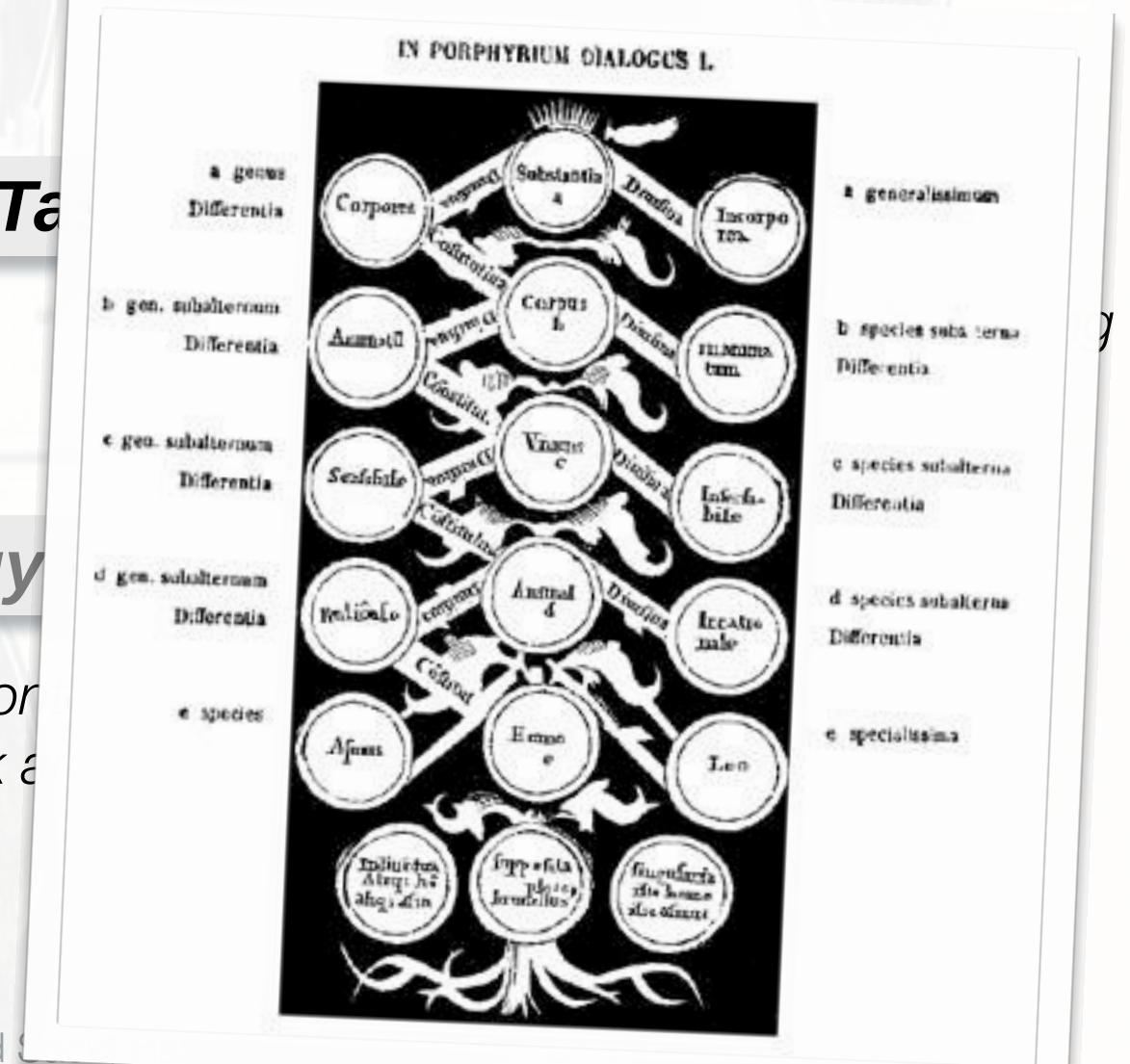
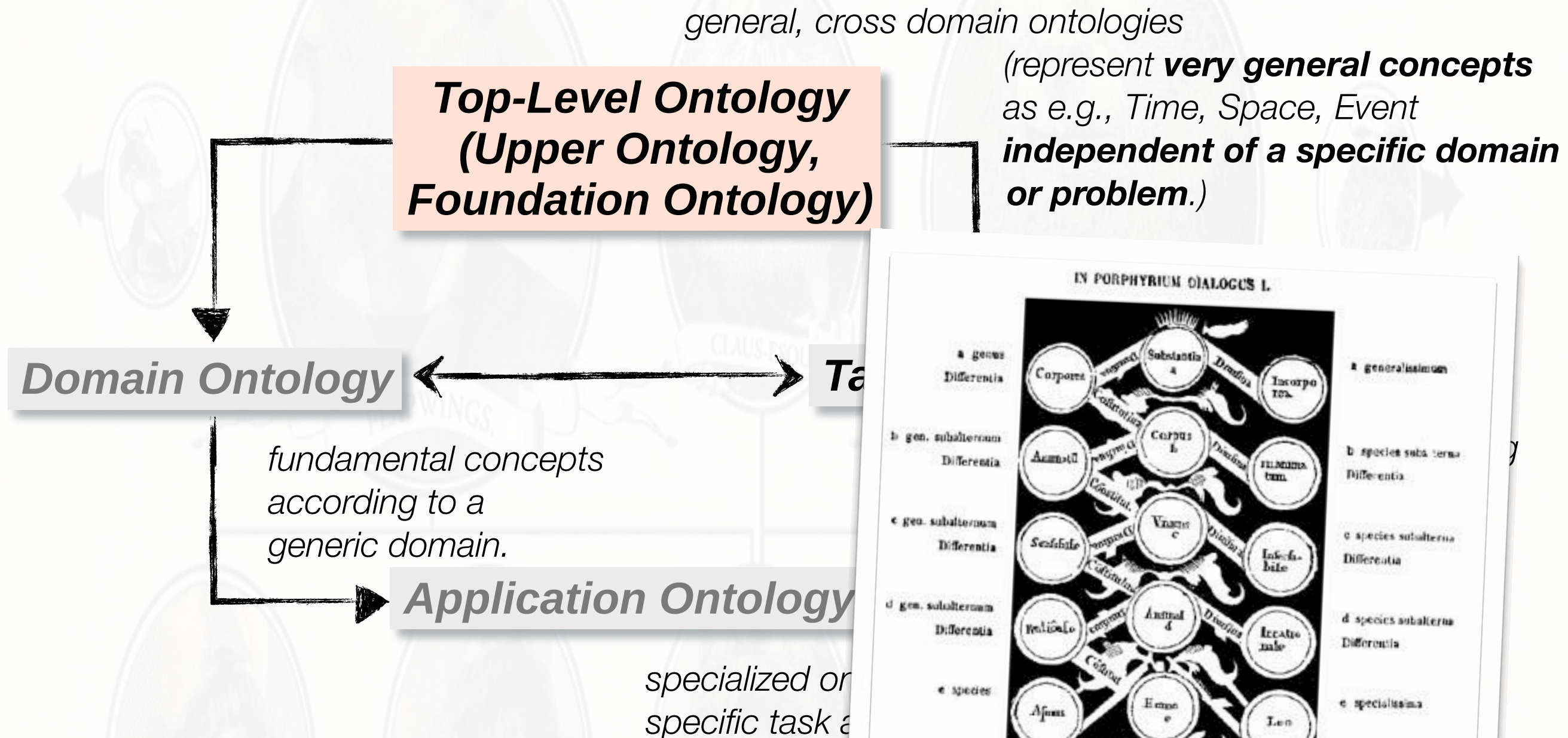
02 Ontology Types

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Lecture 04: Knowledge Representations Pt.1

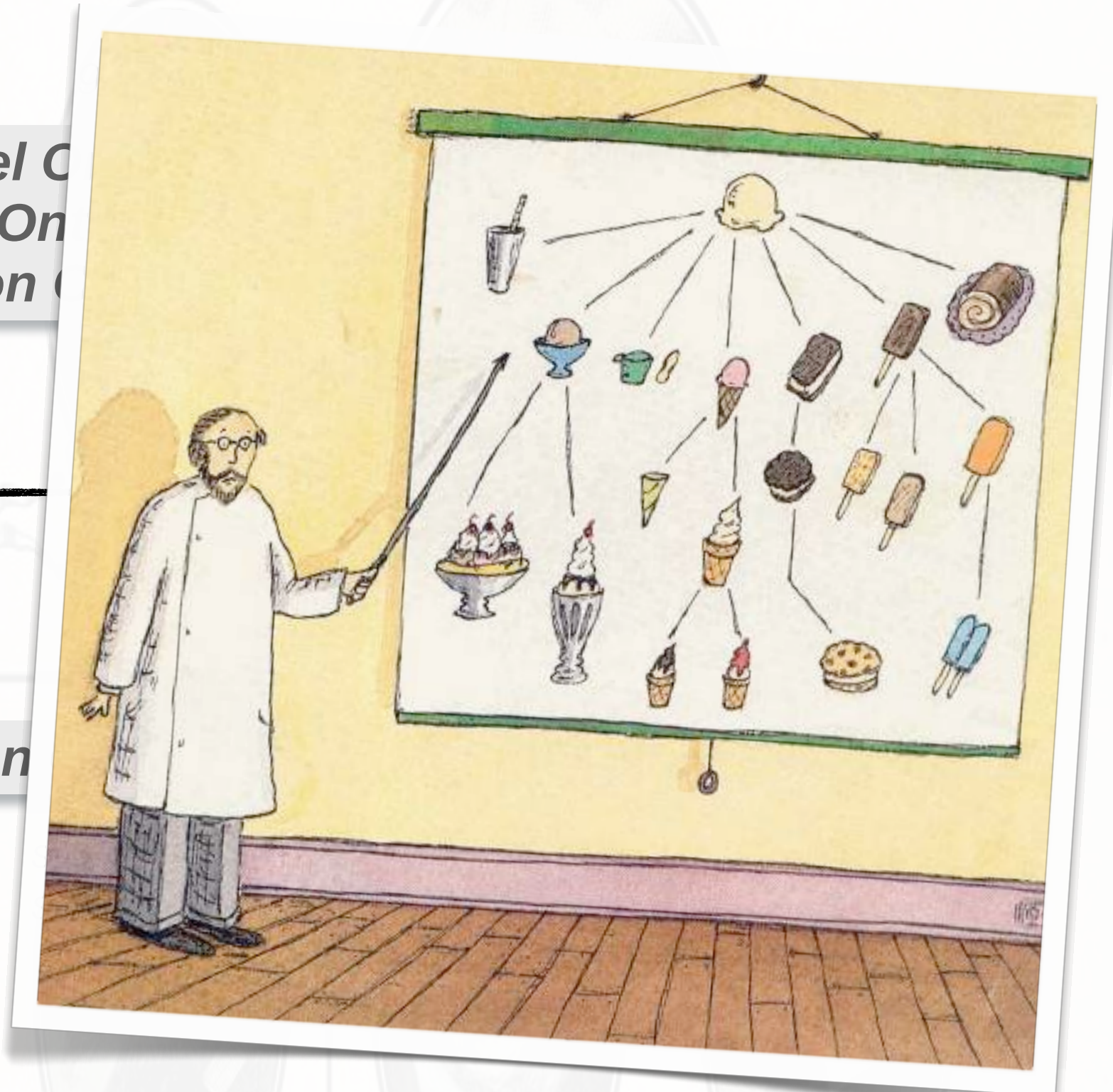
Ontology Types and Categories



Ontology Types and Categories

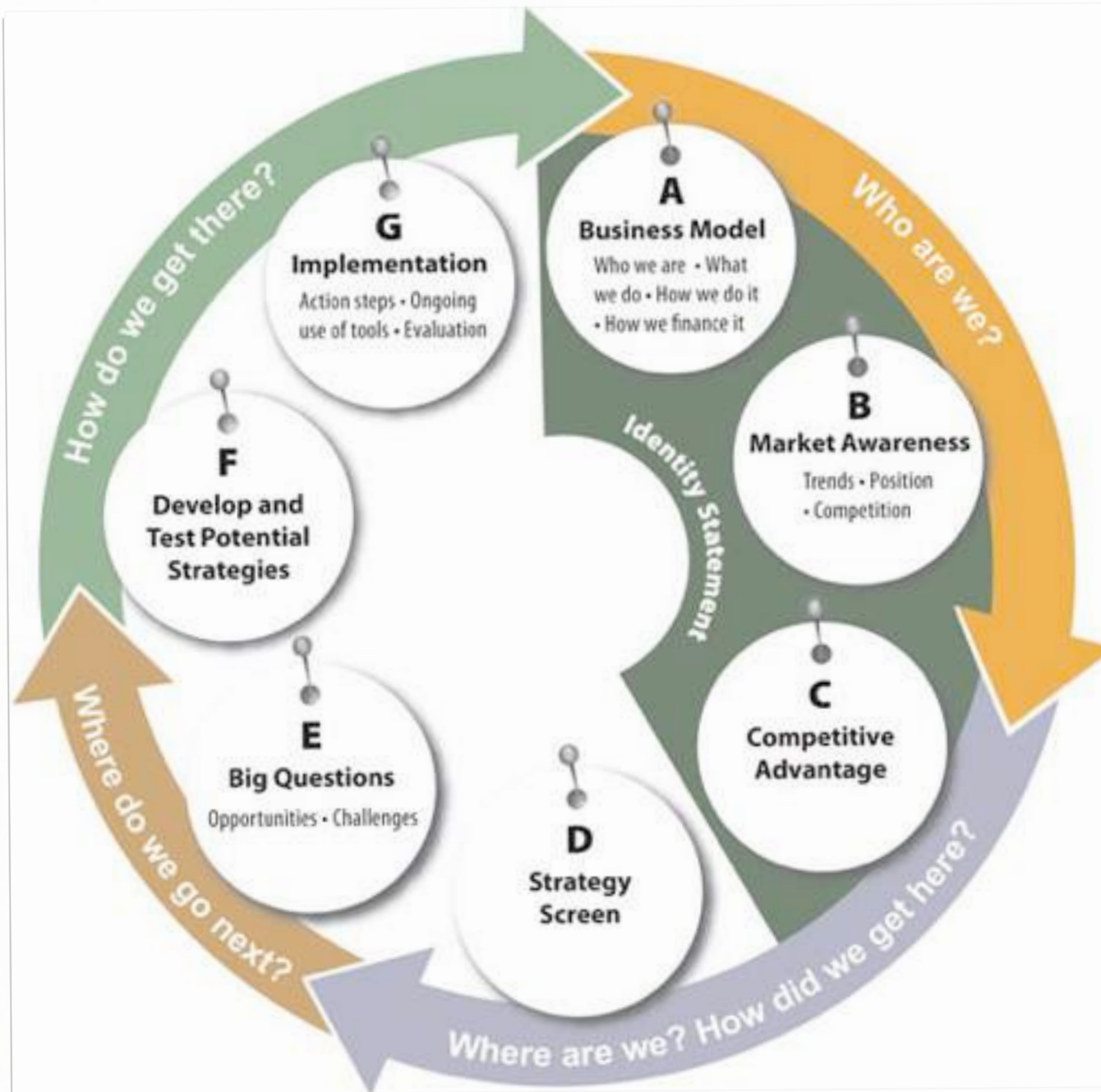


HPI Hasso Plattner Institut



(according to Guarino, 1998)

Ontology Types and Categories



cross domain ontologies

(represent very general concepts as e.g., Time, Space, Event independent of a specific domain or problem.)

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Task Ontology

fundamental concepts according to a **general activity or task**.

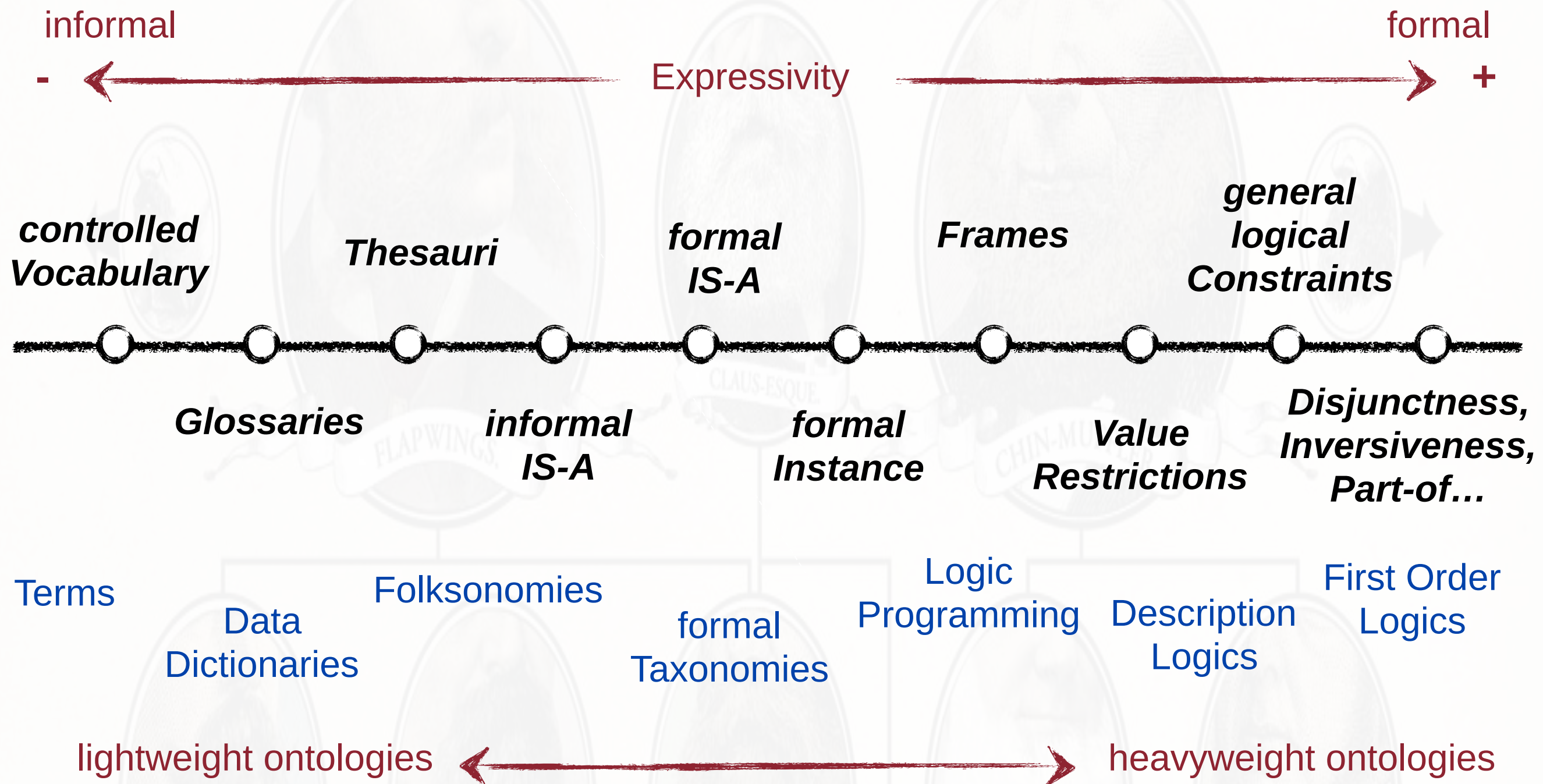
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ontology focussed on a task and domain

Ontology Types and Categories



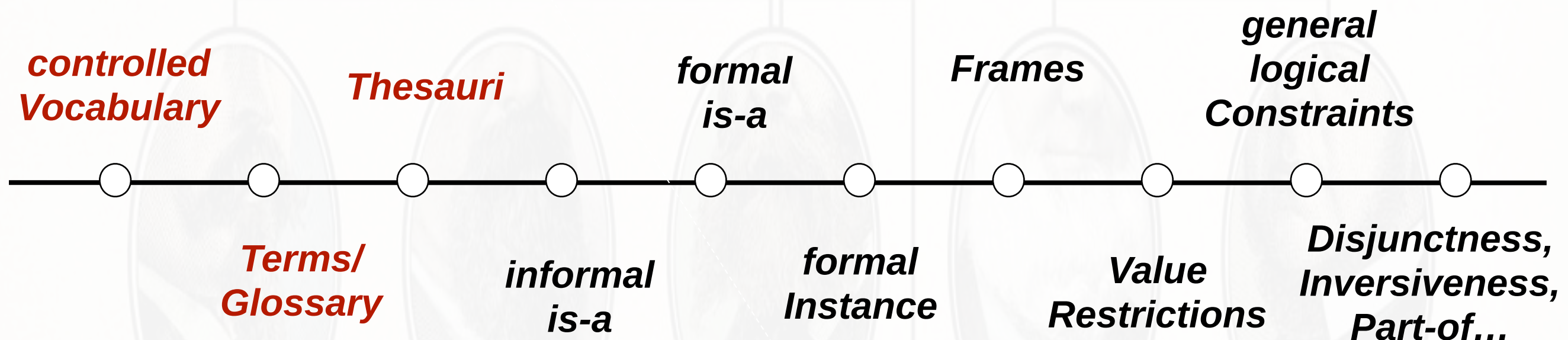
Ontology Types and Categories



(according to Lassila/McGuinness, 2001)

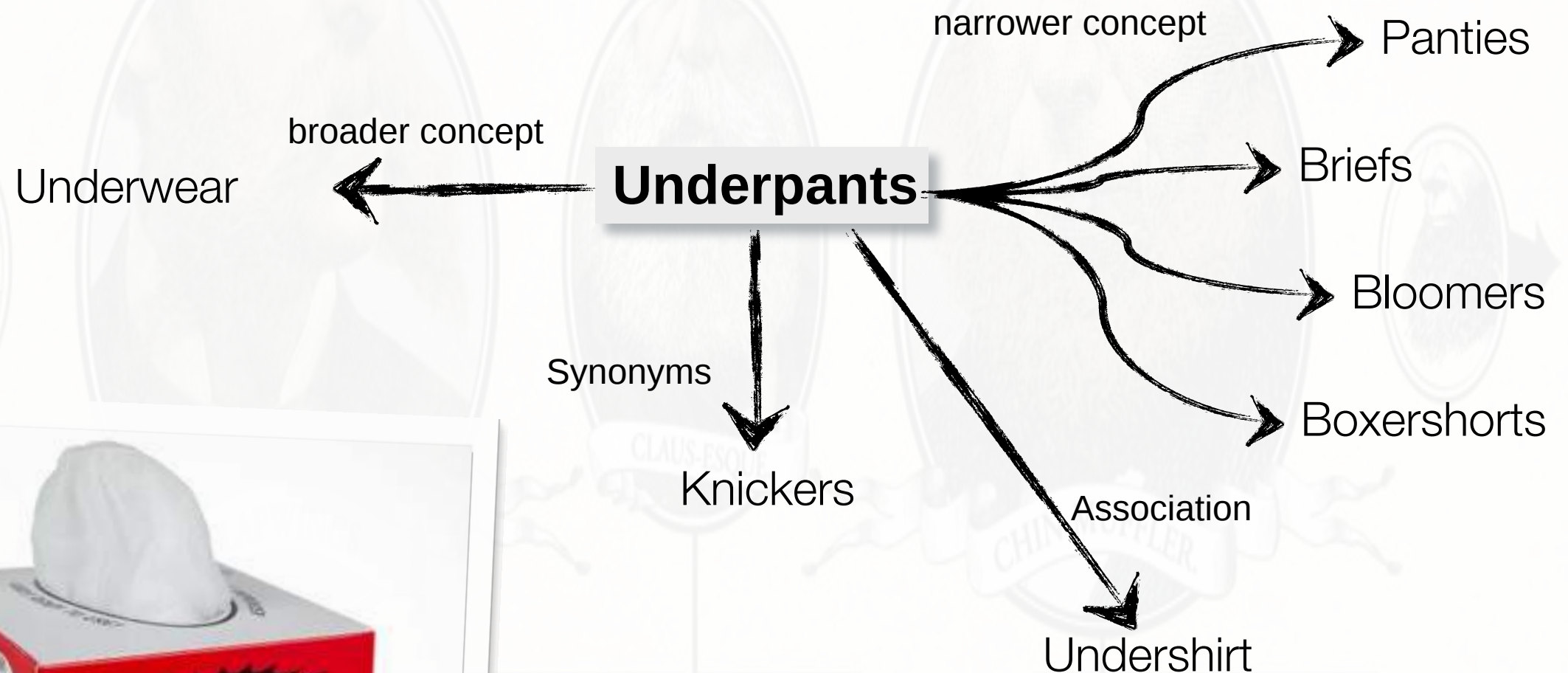
Ontology Types and Categories

- **Controlled Vocabulary:**
finite list of terms (e.g. catalogue)
- **Glossary:**
finite list of terms including an informal definition in natural language
- **Thesauri:** [greek. „treasure, treasure house“]
controlled vocabulary, concepts are connected via relations.
 - Equivalency (synonyms)
 - Hierarchies (subclasses, superclasses)
 - Homographs (Homonyms)
 - Associations (similar concepts)



Example of a Thesaurus Entry...

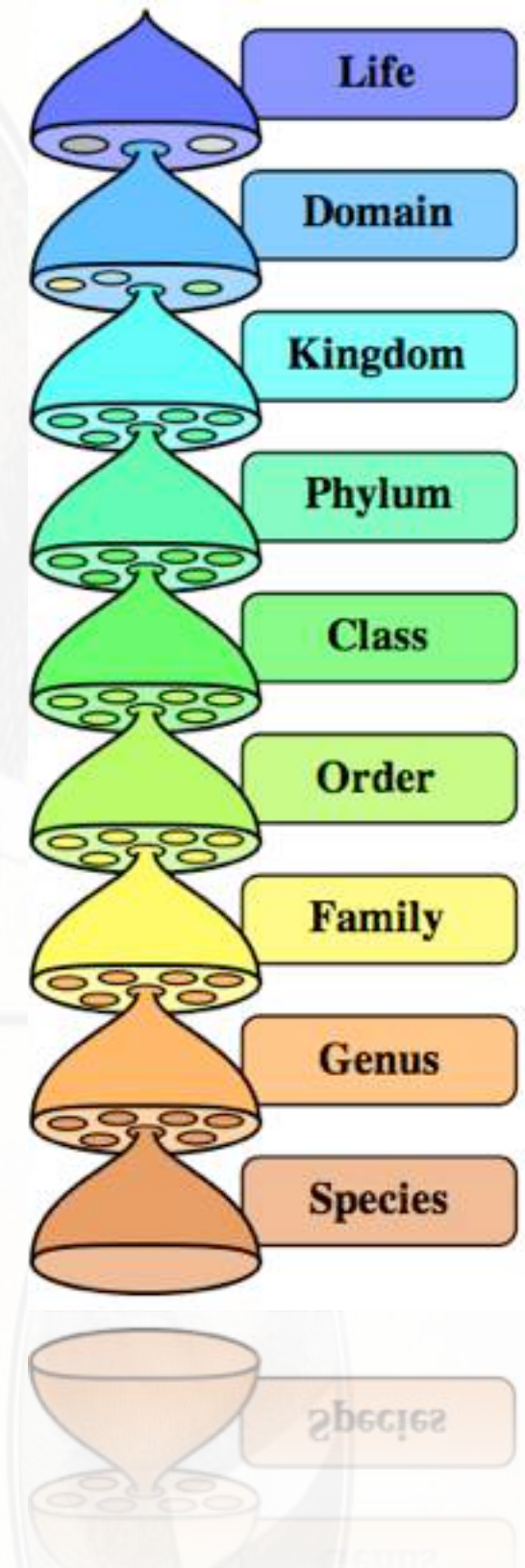
11



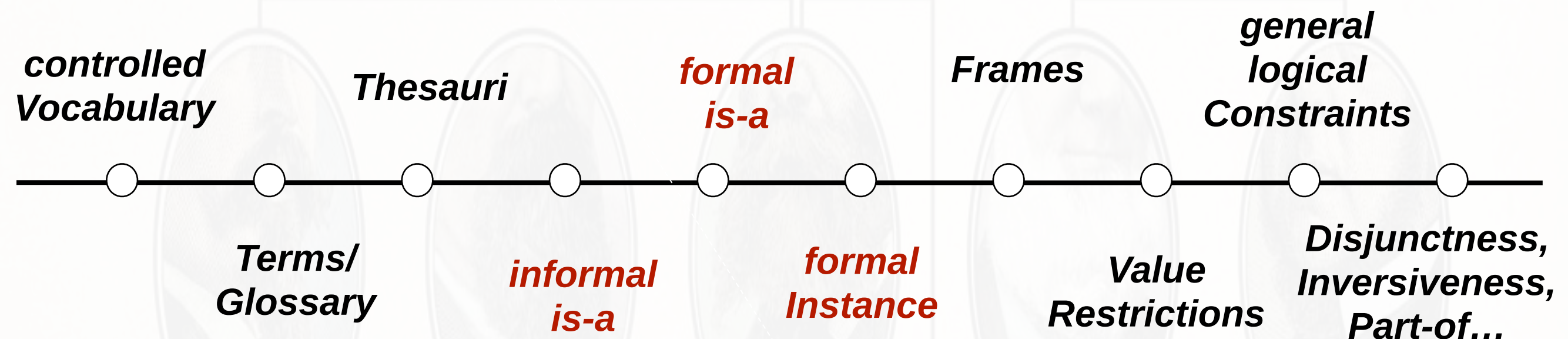
Taxonomies

Taxonomy: Definition of a hierarchical system of groups (from [greek] *τάξις* (*taxis*) = order, arrangement and *νόμος* (*nomos*) = law, science) ...

- also **classification schema**, nomenclature, ...
- in science most times classification into (mono-)hierarchical sets (classes, subclasses, ...)
- (also) subject of **biology**:
 - the arrangement of organisms into a classification according to similarities



- **informal IS-A-Hierarchy:**
explicite hierarchy of classes, subclass relations are not strict
(e.g. index of a library)
- **formal IS-A-Hierarchy:**
explicite hierarchy of classes, subclass relations are strict
- **formale instance:**
explicite class hierarchy, besides strict subclass relations also
instance-of relations are allowed





But, beware.....

15 various categories of animals from "a certain chinese encyclopedia" according to Jorge Luis Borges:

- THOSE THAT BELONG TO THE EMPEROR
- EMBALMED ONES
- THOSE THAT ARE TRAINED
- SUCKLING PIGS
- MERMAIDS (OR SIRENS)
- FABULOUS ONES
- STRAY DOGS
- THOSE THAT ARE INCLUDED IN THIS CLASSIFICATION
- THOSE THAT TREMBLE AS IF THEY WERE MAD
- INNUMERABLE ONES
- THOSE DRAWN WITH A VERY FINE CAMEL HAIR BRUSH
- ET CETERA
- THOSE THAT HAVE JUST BROKEN THE FLOWER VASE
- THOSE THAT, AT A DISTANCE, RESEMBLE FLIES





03 Foundations of Logic

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Lecture 04: Knowledge Representations Pt.1