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# MATERIAL ONTOLOGY

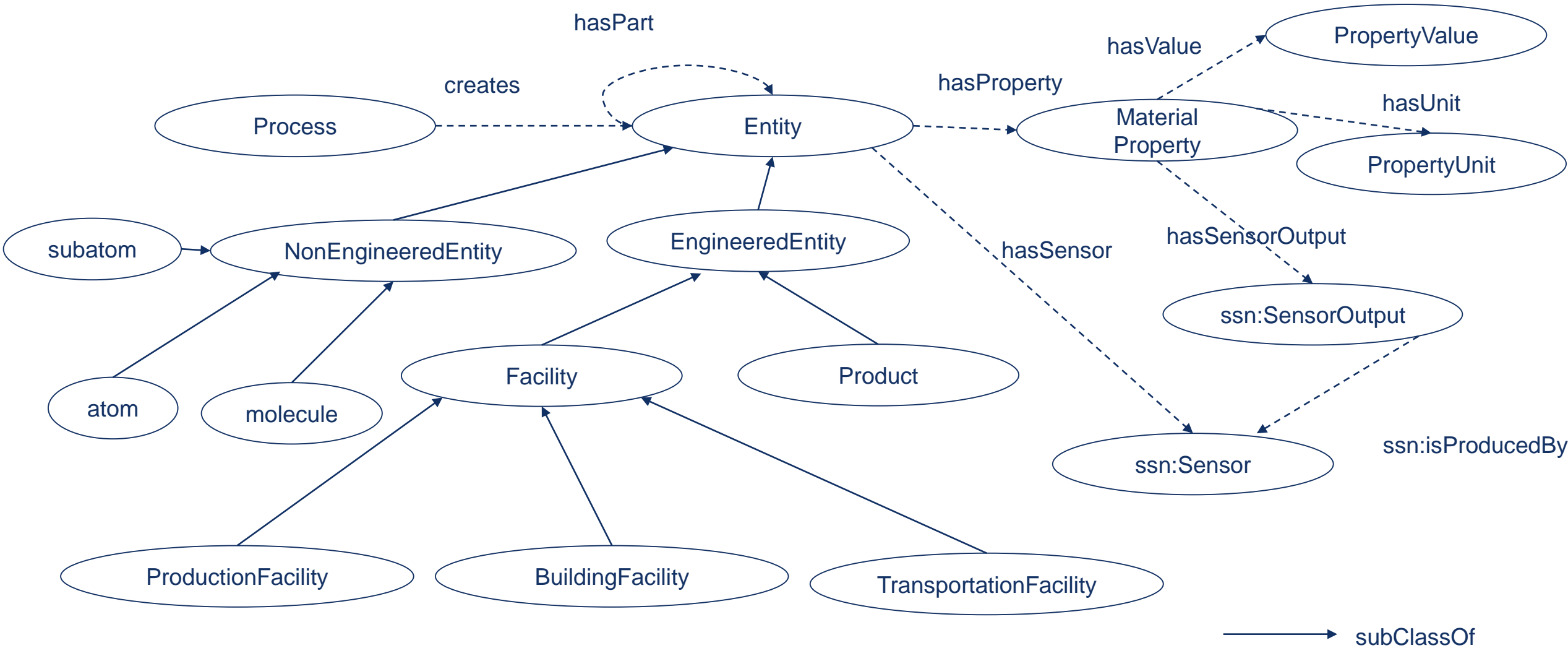
Prof. Dr.-Ing. Hendro Wicaksono



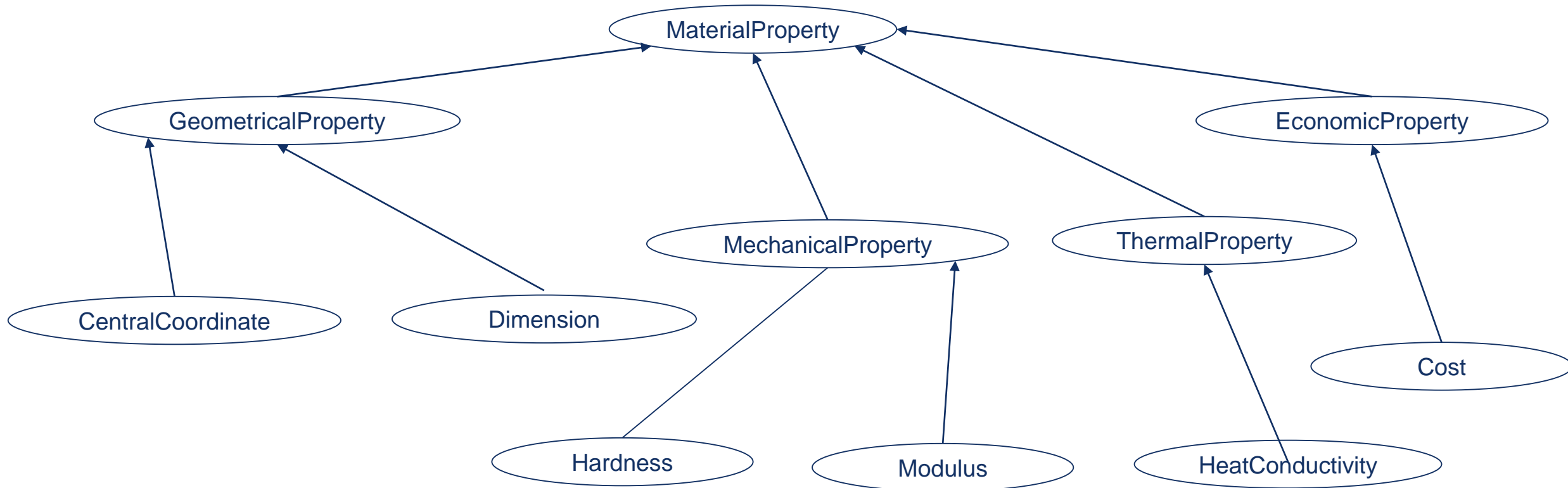
# EXPERIENCES IN ONTOLOGY MODELLING RELATED TO MATERIAL

- Project experiences using ontologies related to materials:
  - Energy management in building, two EU projects: KnoHoIEM, DAREED
  - Energy management in manufacturing, two German national projects: wEnPro, ecoBalance
- Material information modelling focuses on:
  - Use case building: material of building and building parts.
  - Use case manufacturing: material of product and manufacturing facilities, including both engineered and non-engineered materials
- Each entity has material properties. Some material properties can be sensed or measured using sensors
- The ontology import Semantic Sensor Network (SSN) ontology which connect the material properties that can be measured using sensors.
- Material properties are used characterize the facilities (building, production facilities), products, manufacturing resources, etc.

# THE UPPER PART OF THE ONTOLOGY



# THE TAXONOMY OF MATERIAL PROPERTY



# IMPORTED ONTOLOGIES/ VOCABULARIES, AMONG OTHERS:

## 1. Semantic Sensor Network Ontology

<http://www.w3.org/ns/ssn/>

## 2. ifcOWL

<http://www.buildingsmart-tech.org/ifcOWL/IFC4/>

## 3. Ontology of Units of Measure

<http://www.wurvoc.org/bibliography/om-2>

## 4. GeoSPARQL

<http://www.opengis.net/ont/geosparql>

## 5. RDF Data Cube Vocabulary

<http://purl.org/linked-data/cube>

## 6. Time ontology

<http://www.w3.org/2006/time>

# REPRESENTATION, PURPOSE, AND METHODOLOGY

- Representation:
  - OWL/RDF
- Purpose of the ontology:
  - Providing abstract layer containing taxonomy for heterogeneous data sources.
  - Database interlinking.
  - Data routing.
- Methodology to use the ontology:
  - Integration of the ontology as the abstract data model in an interface layer between data and application layers in a software platform.

# CONTACT

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