

# PLCS Requirements for a Units Ontology

# Use Case : PLCS

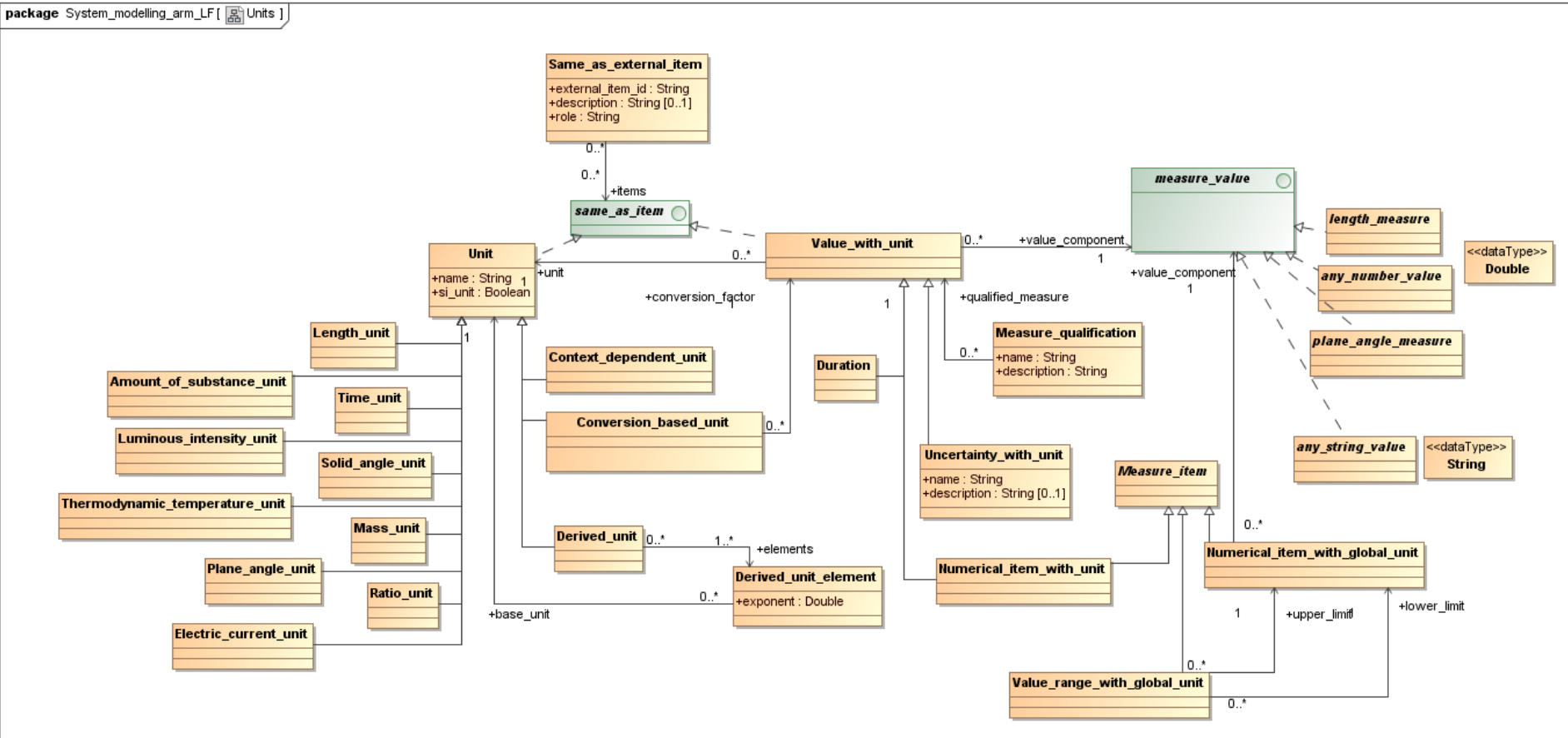
- » OASIS Product Life Cycle Support Technical Committee
  - creating standards used by organizations such as the UK MoD to integrate data between applications used to support Ships, Aircraft, etc.
- » The standard has three parts
  - A schema for the data exchange itself (e.g. XML Schema)
  - Specs telling how to use the schema elements for a particular exchange (they call these Data Exchange Specifications or DEXs)
    - » Feedback about about maintenance applied to an aircraft, for example
  - An OWL ontology defining classes used to add detailed semantics to concepts in the exchange
    - » Kinds of Maintenance Tasks for example

# Relating exchange data and the ontology

- » To relate the data in an exchange file with the OWL ontology two relationships are defined within the schema itself
  - Classification\_assignment allows the statement that the instance in the exchange file is a member of a class in the ontology
    - » rdf:type
  - Same\_as\_external\_item allows the statement that the instance in the exchange file is the same thing as a class or individual in the ontology
    - » owl:sameAs

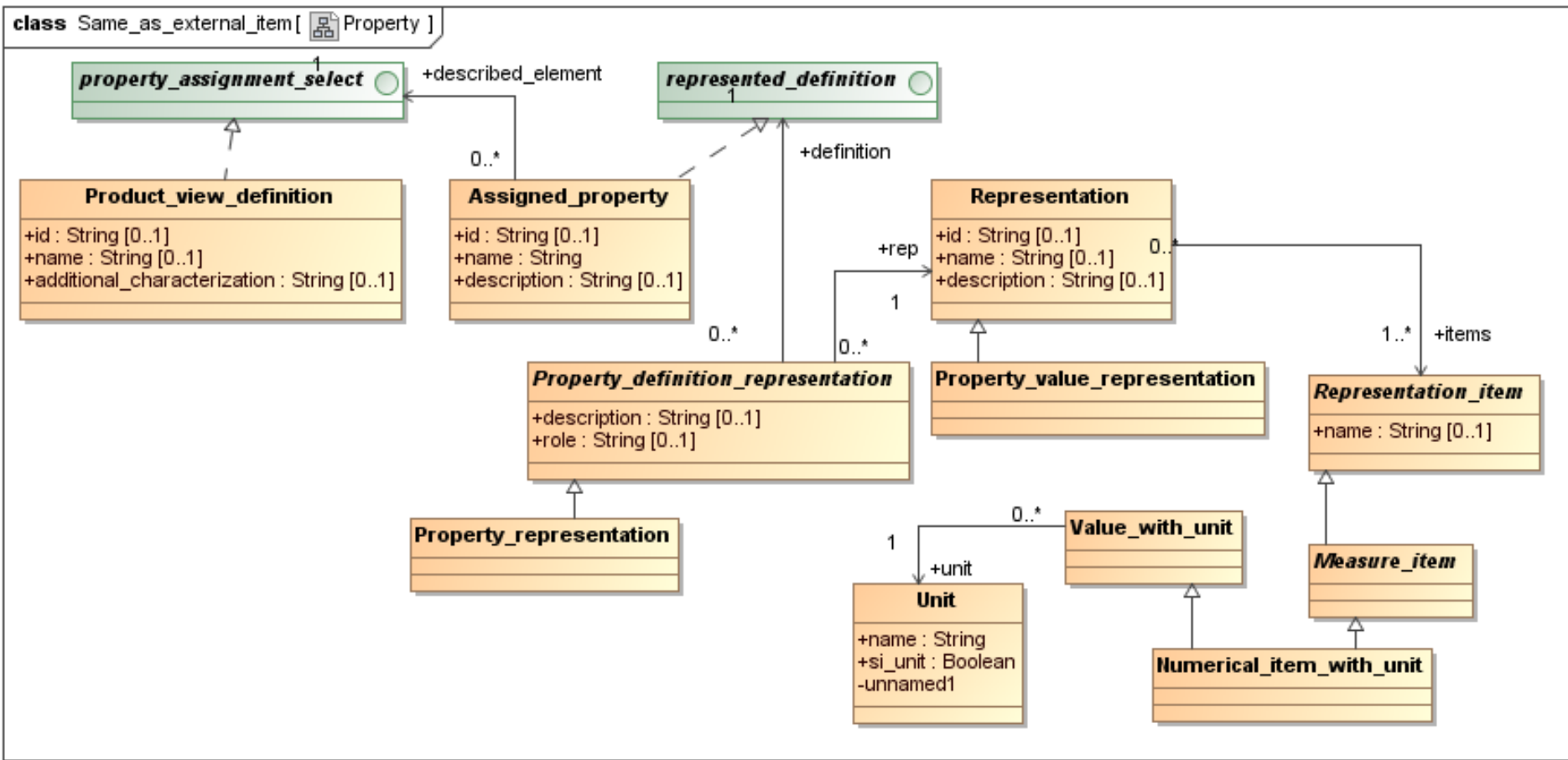
# Values with Units in schema

» Value has value component and unit component



# Property in schema

- » Thing is assigned property that has representations made up of items (numerical items are only one kind)



# Overall need

- » Ontologies that
  - Include Library of properties to relate to Assigned\_property
  - Include Library of Units (i.e. SI units)
  - Are extensible by using organizations
    - » Number of sorties for aircraft, PersonDay
  - Have cross-industry consensus
    - » ISO TC 184 SC 4 Industrial Data
      - ISO 10303-239 as basis of PLCS
      - ISO 10303-233 Systems Engineering (AP233)
      - ISO 15926 for Oil and Gas
    - » OASIS PLCS TC for ontologies and DEXs
    - » OMG Systems Engineering
      - Standardizing AP233-OMG SysML mapping
      - AP233 will use same Units ontology as PLCS

# Short Term Needs

- » PLCS Version 1 passed OASIS ballot
  - Resolving ballot comments against existing PLCS OWL ontologies based on existing schema
    - » Many problems with units part of ontology
    - » Added Same as capability to schema for use with units
- » Approach we want to take
  - Replace subclasses of Unit in schema with use of Units ontology
    - » Instance of Unit in exchange file is same as individual of type Unit in ontology
  - Depend on “units experts” to get it right rather than doing it in OASIS PLCS TC if possible

# Desired result

