

CFIHOS Data Model

(C-DM-001)

(version 1.4.1)

Examples :

Source is
Owner/Operator

Plant

Source is EPC /
Contractor

Tag

Source is
Owner/Operator or
EPC / Contractor

Purchase order

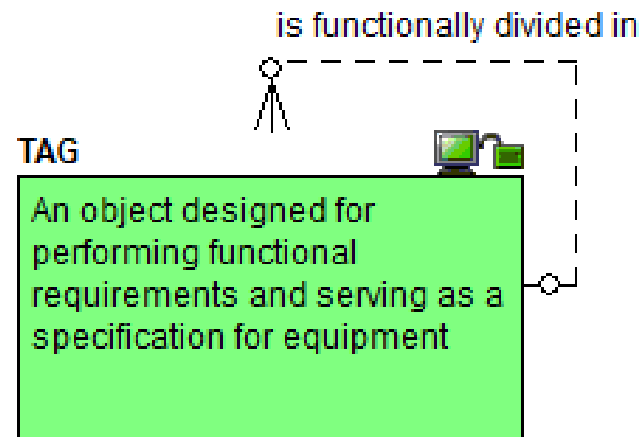
Source is CFIHOS
RDL

Tag class

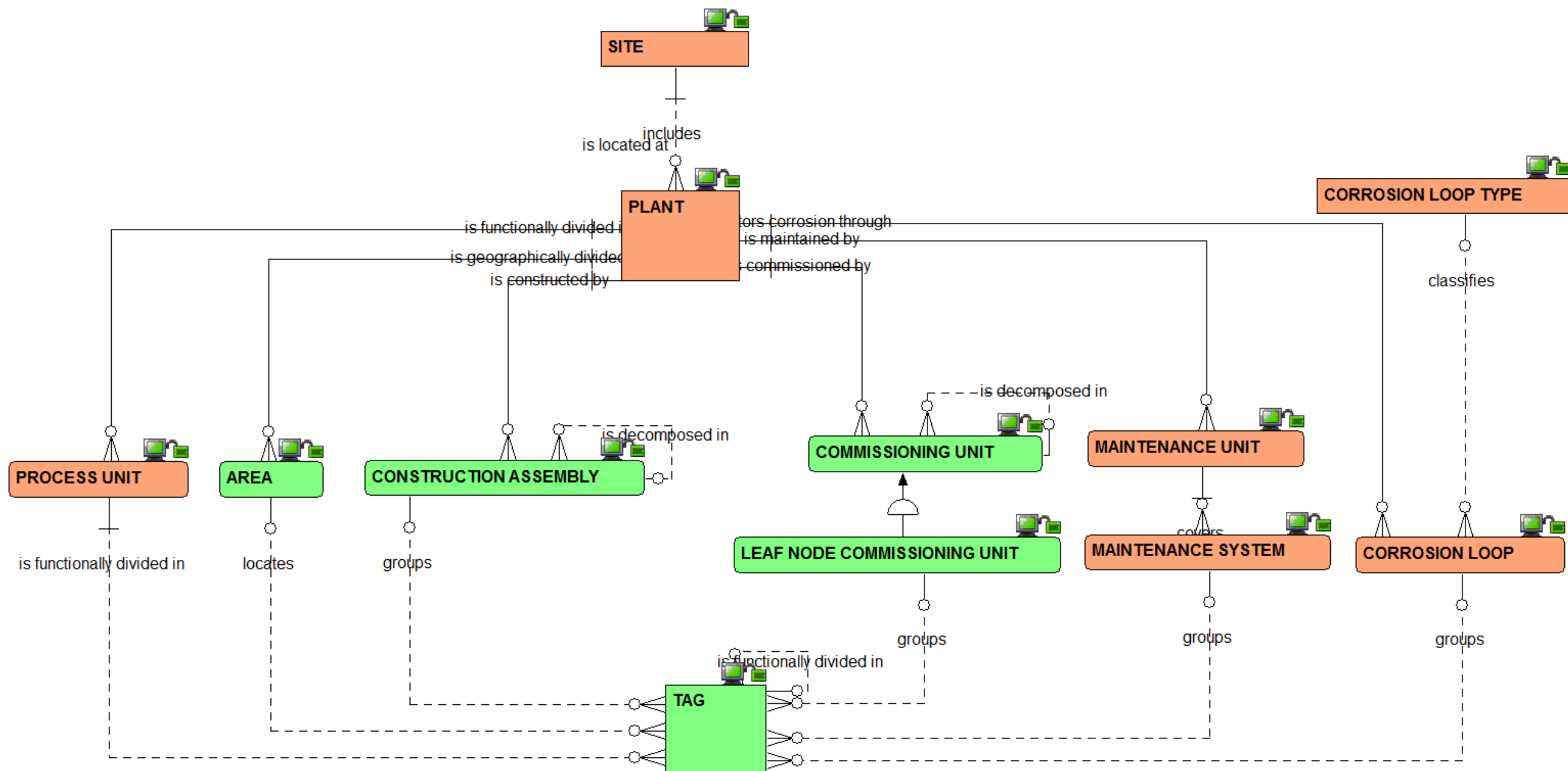
Not part of the data modeling technique, but useful for communicating :

Adoption of a "coloring" standard to indicate the source of the data

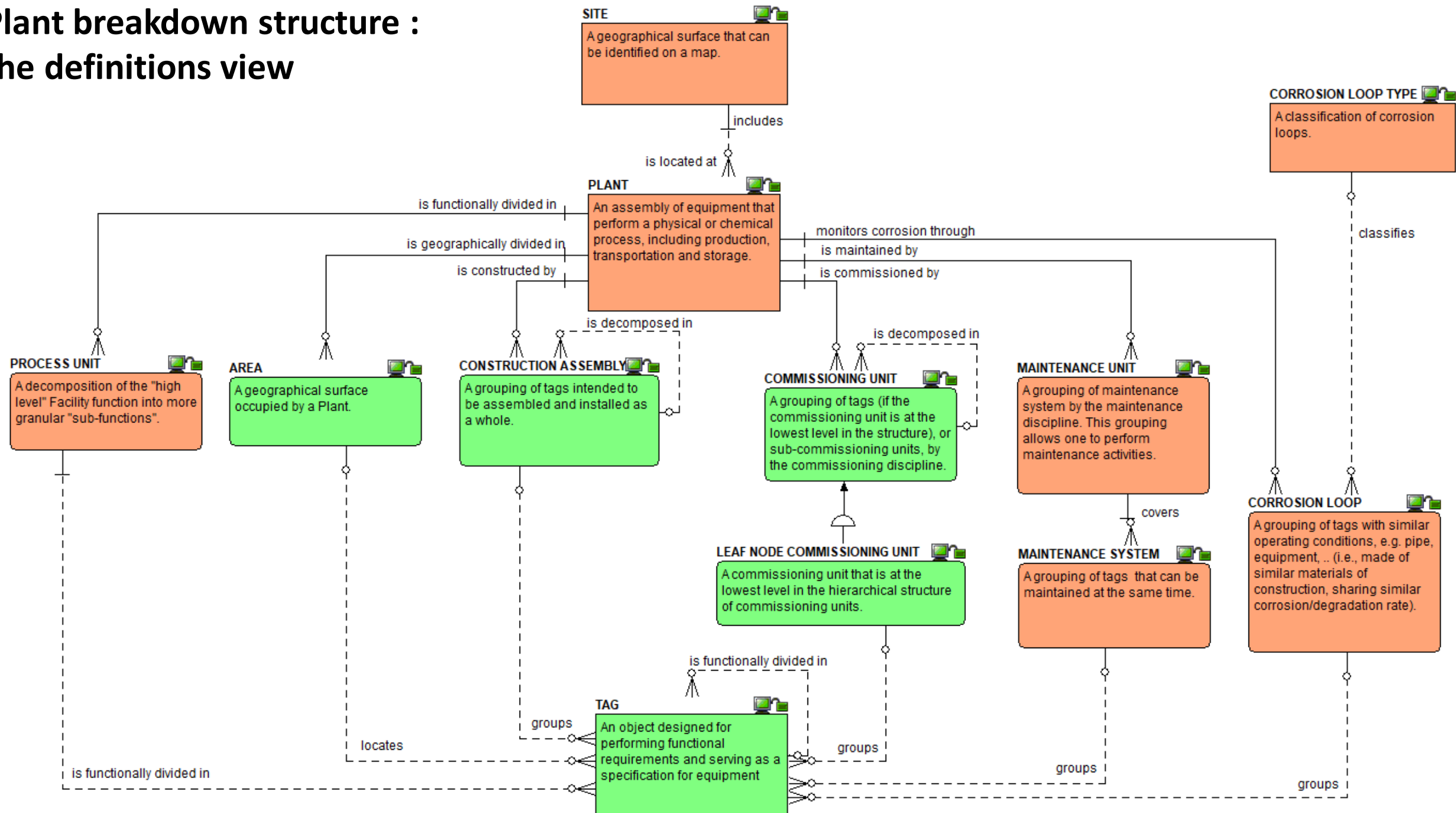
Starting point : the tag



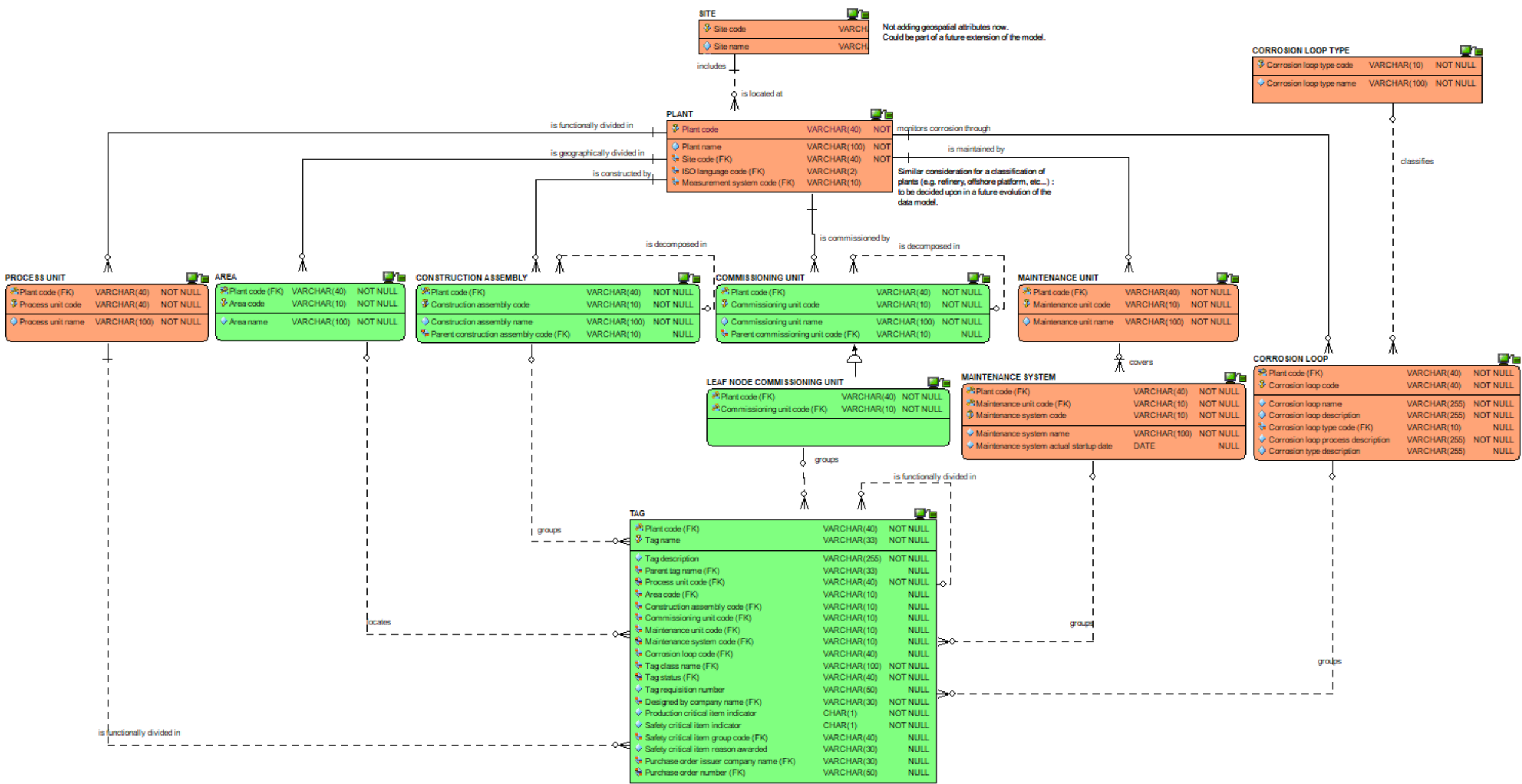
Plant breakdown structure : the relationships view



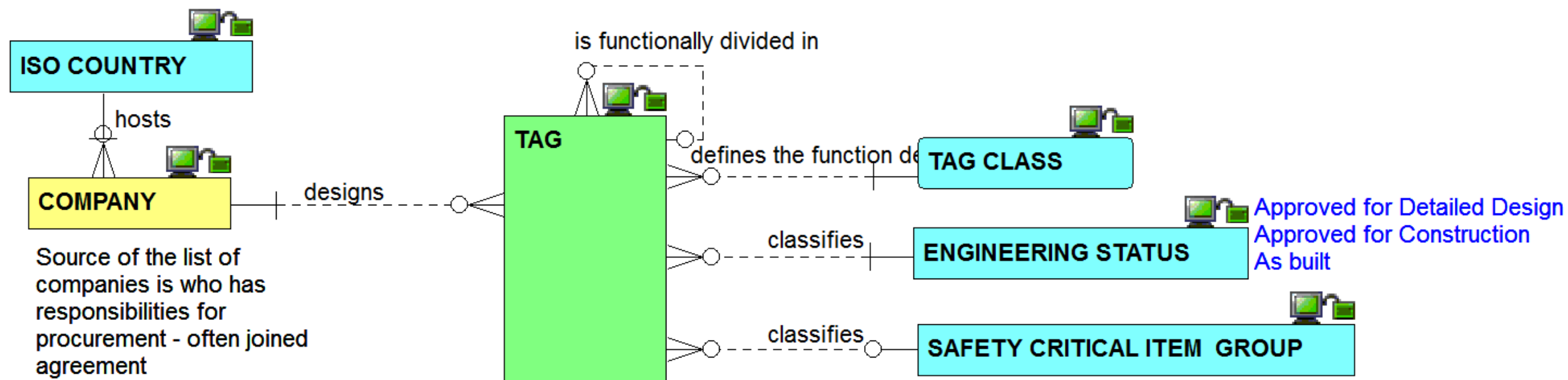
Plant breakdown structure : the definitions view



Plant breakdown structure : the attributes view



Other tag inbound relationships view



Source of the list of companies is who has responsibilities for procurement - often joined agreement

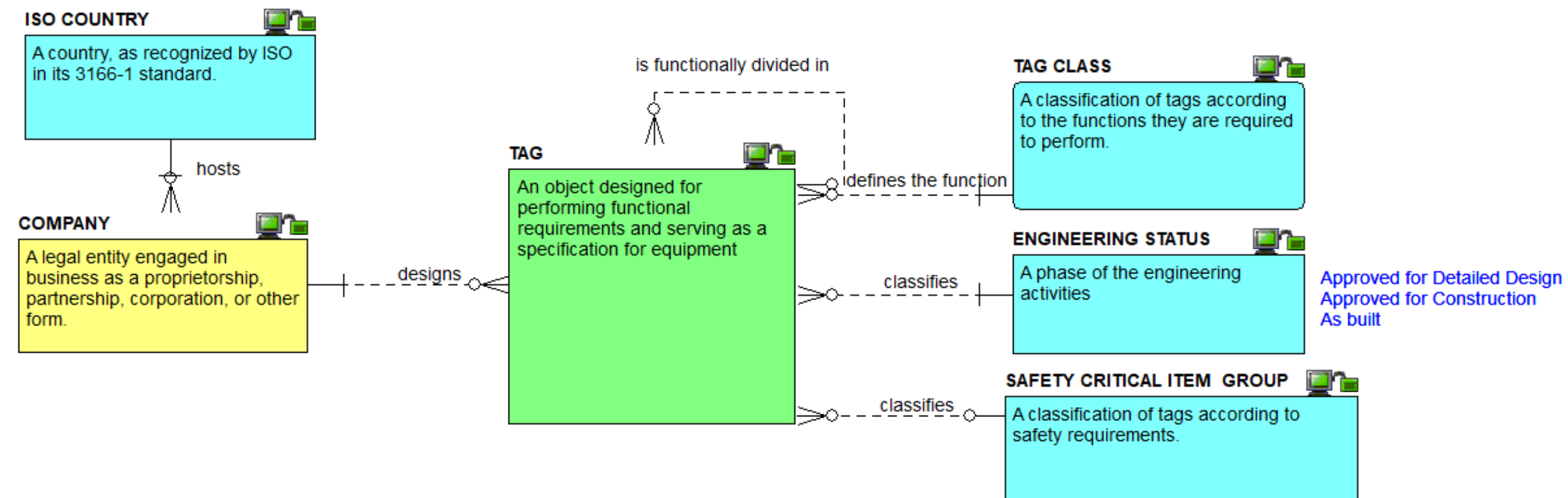
Keep the good idea of the relationship between model and tag for future evolution

DS001
DS002
DS003
ER001
...

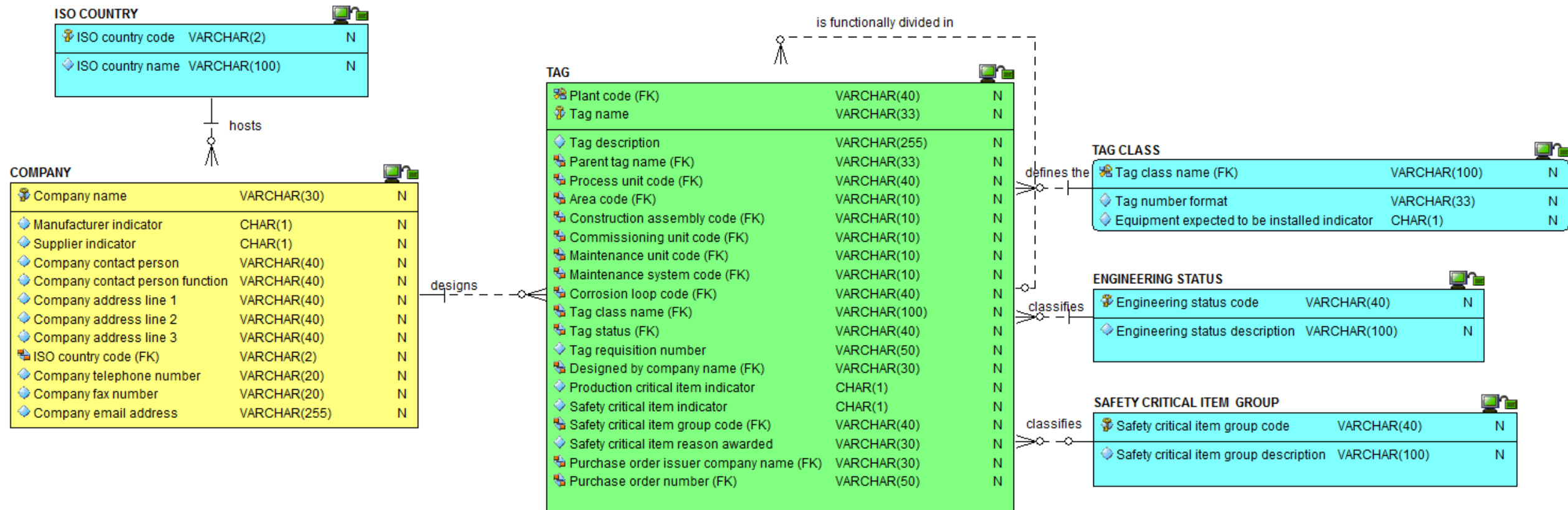
These are Shell specific, and should be removed from the RDL.

If there is an international standard does exist, it should replace what is currently present in the RDL

Other tag inbound definitions view



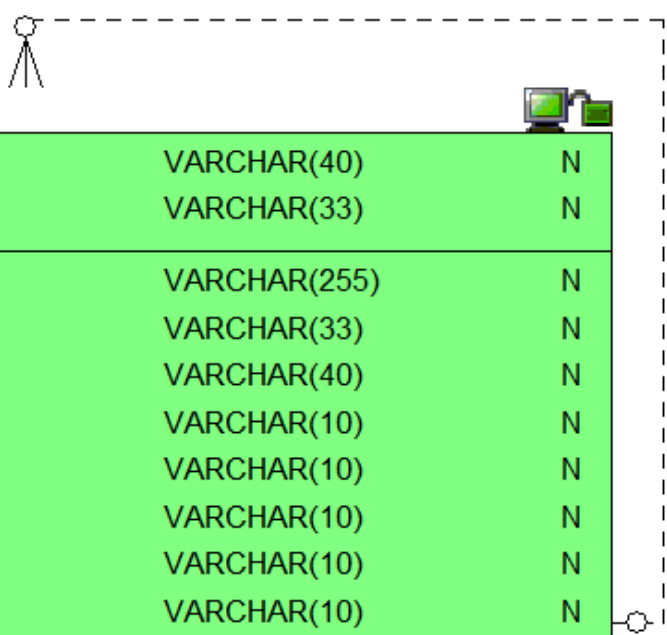
Other tag inbound attributes view



The tag attributes view

is functionally divided in

TAG



Plant code (FK)	VARCHAR(40)	N
Tag name	VARCHAR(33)	N
Tag description	VARCHAR(255)	N
Parent tag name (FK)	VARCHAR(33)	N
Process unit code (FK)	VARCHAR(40)	N
Area code (FK)	VARCHAR(10)	N
Construction assembly code (FK)	VARCHAR(10)	N
Commissioning unit code (FK)	VARCHAR(10)	N
Maintenance unit code (FK)	VARCHAR(10)	N
Maintenance system code (FK)	VARCHAR(10)	N
Corrosion loop code (FK)	VARCHAR(40)	N
Tag class name (FK)	VARCHAR(100)	N
Tag status (FK)	VARCHAR(40)	N
Tag requisition number	VARCHAR(50)	N
Designed by company name (FK)	VARCHAR(30)	N
Production critical item indicator	CHAR(1)	N
Safety critical item indicator	CHAR(1)	N
Safety critical item group code (FK)	VARCHAR(40)	N
Safety critical item reason awarded	VARCHAR(30)	N
Purchase order issuer company name (FK)	VARCHAR(30)	N
Purchase order number (FK)	VARCHAR(50)	N

Keep the good ideas of

Add environmental critical item indicator ?

Add maintenance criticality assessment ?
More types of criticalities ?

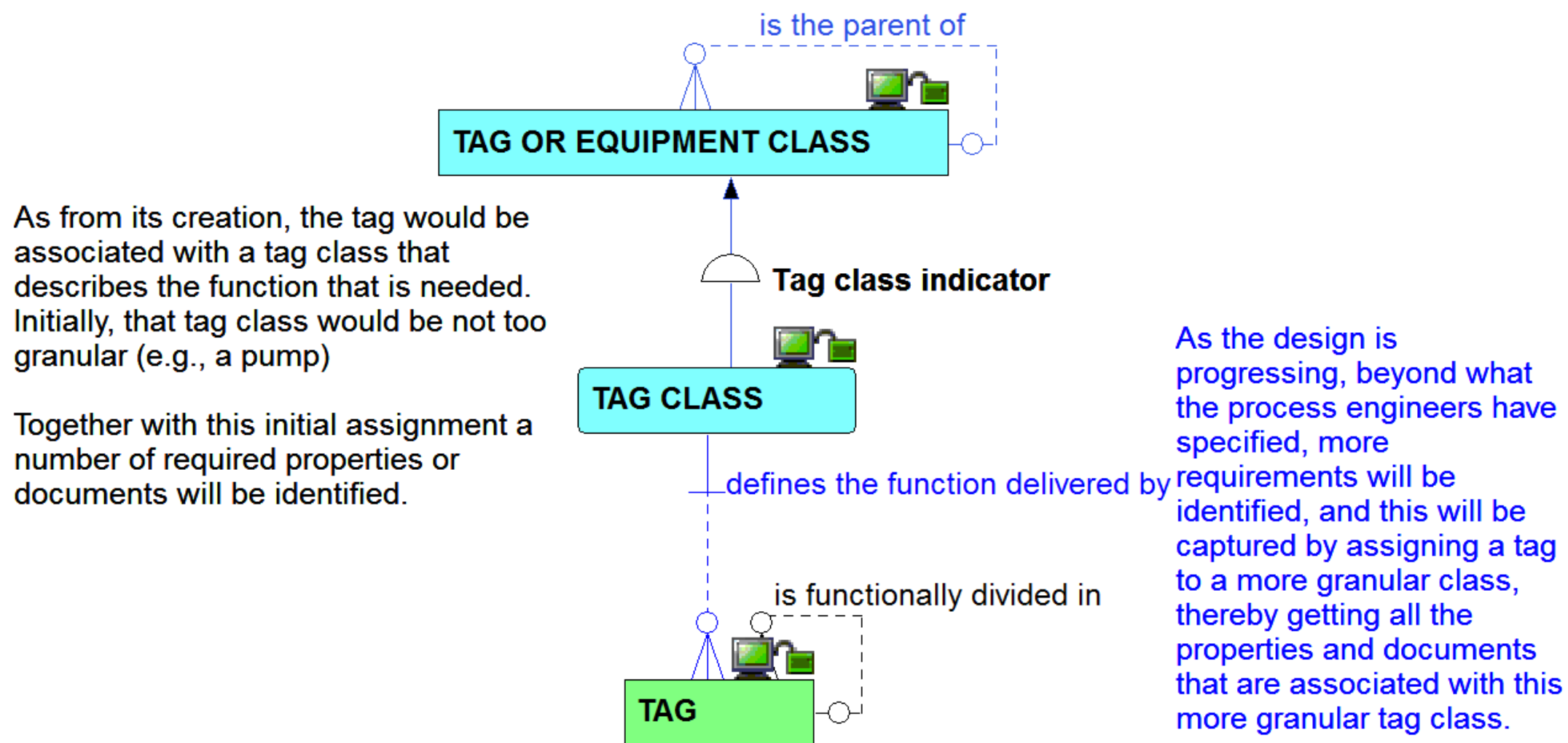
Should tags be owned by owner/operator, with columns populated by EPC ?

Should there be a ready for operation indicator ?

>>> Tag aliases should be added - separate entity with one tag having multiple tag aliases (needed for hand over)

Tag maturity vs tag status (e.g. provided to a contractor as a range of numbers) ? (rather focusses on how owner is handling its data)

Tag and its relationship to tag class



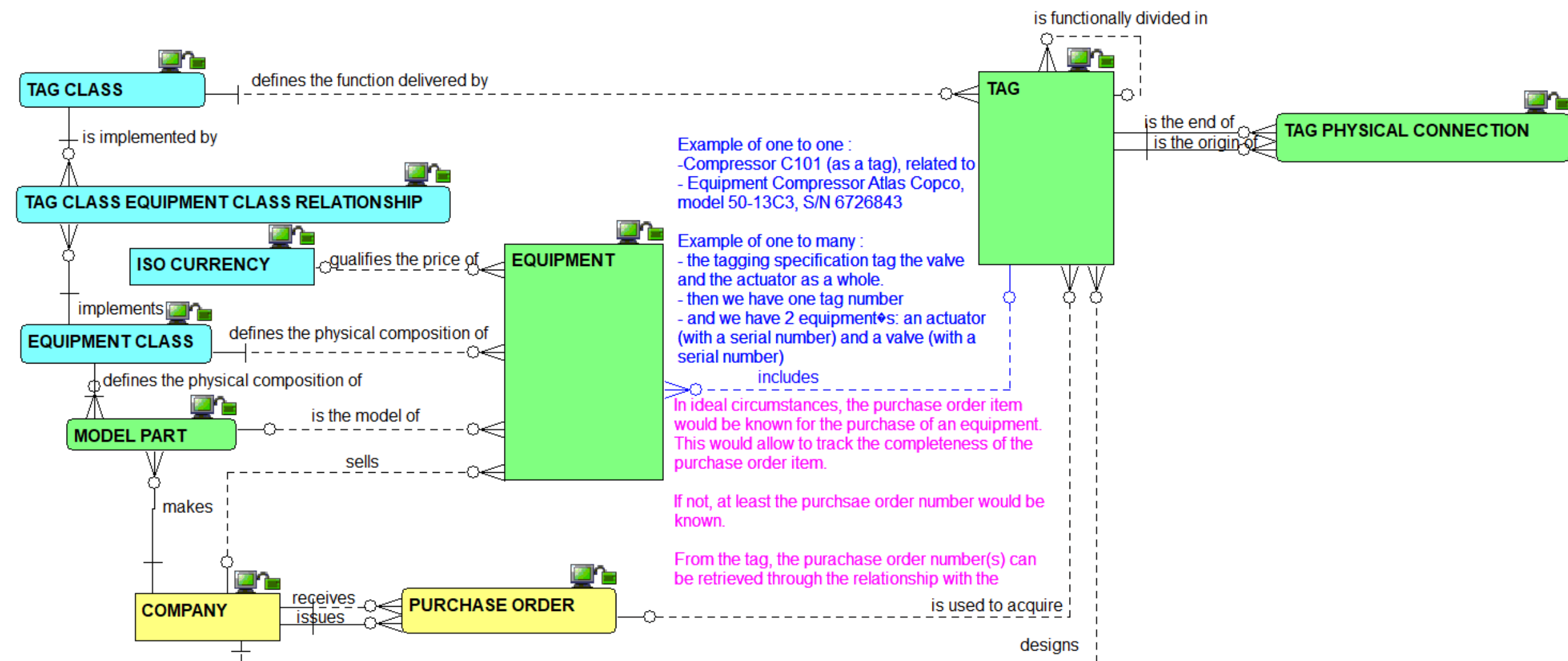
As from its creation, the tag would be associated with a tag class that describes the function that is needed. Initially, that tag class would be not too granular (e.g., a pump)

Together with this initial assignment a number of required properties or documents will be identified.

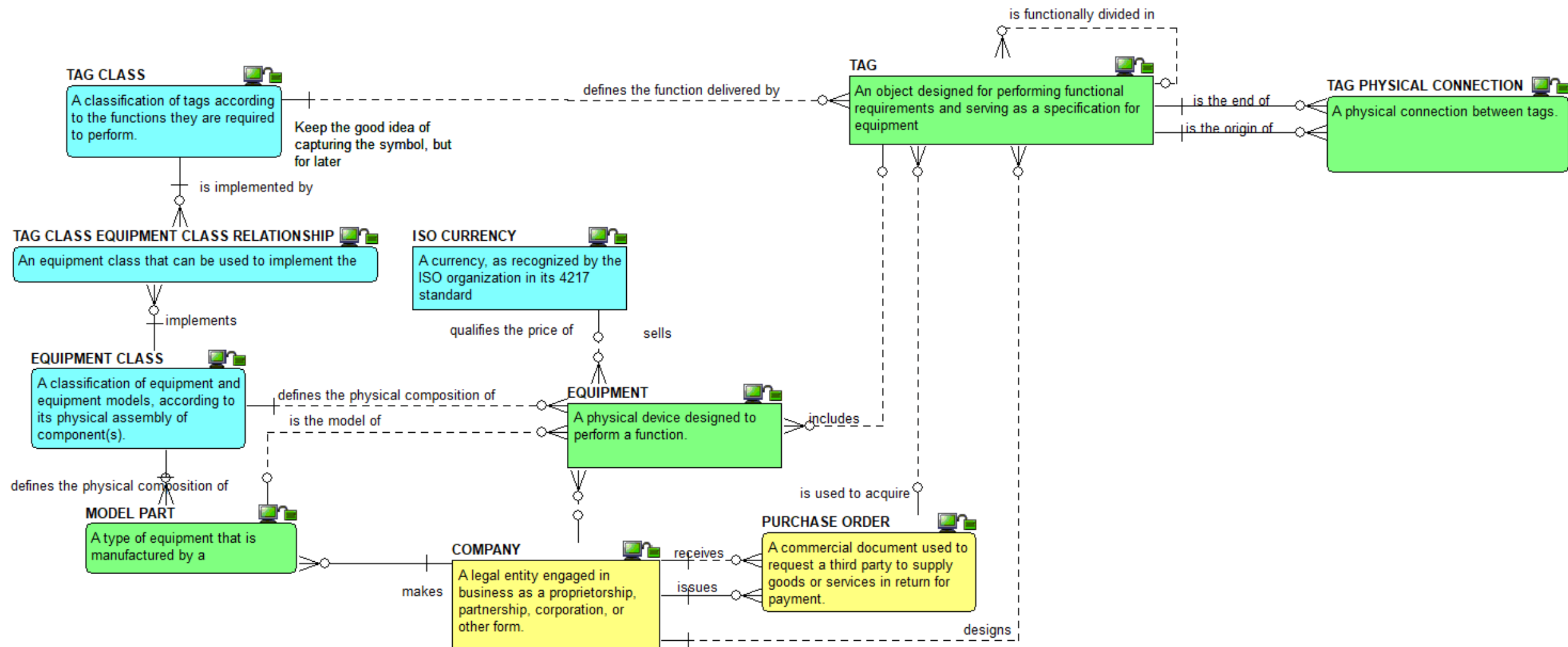
As the design is progressing, beyond what the process engineers have specified, more requirements will be identified, and this will be captured by assigning a tag to a more granular class, thereby getting all the properties and documents that are associated with this more granular tag class.

Net consequence of this : even if the equipment disappears (with thereby its connection to the equipment class and the related properties and documents) all requirements for the tag will still be available, because they are all associated with the tag. The tag will thus represents a comprehensive view of all the requirements that were specified.

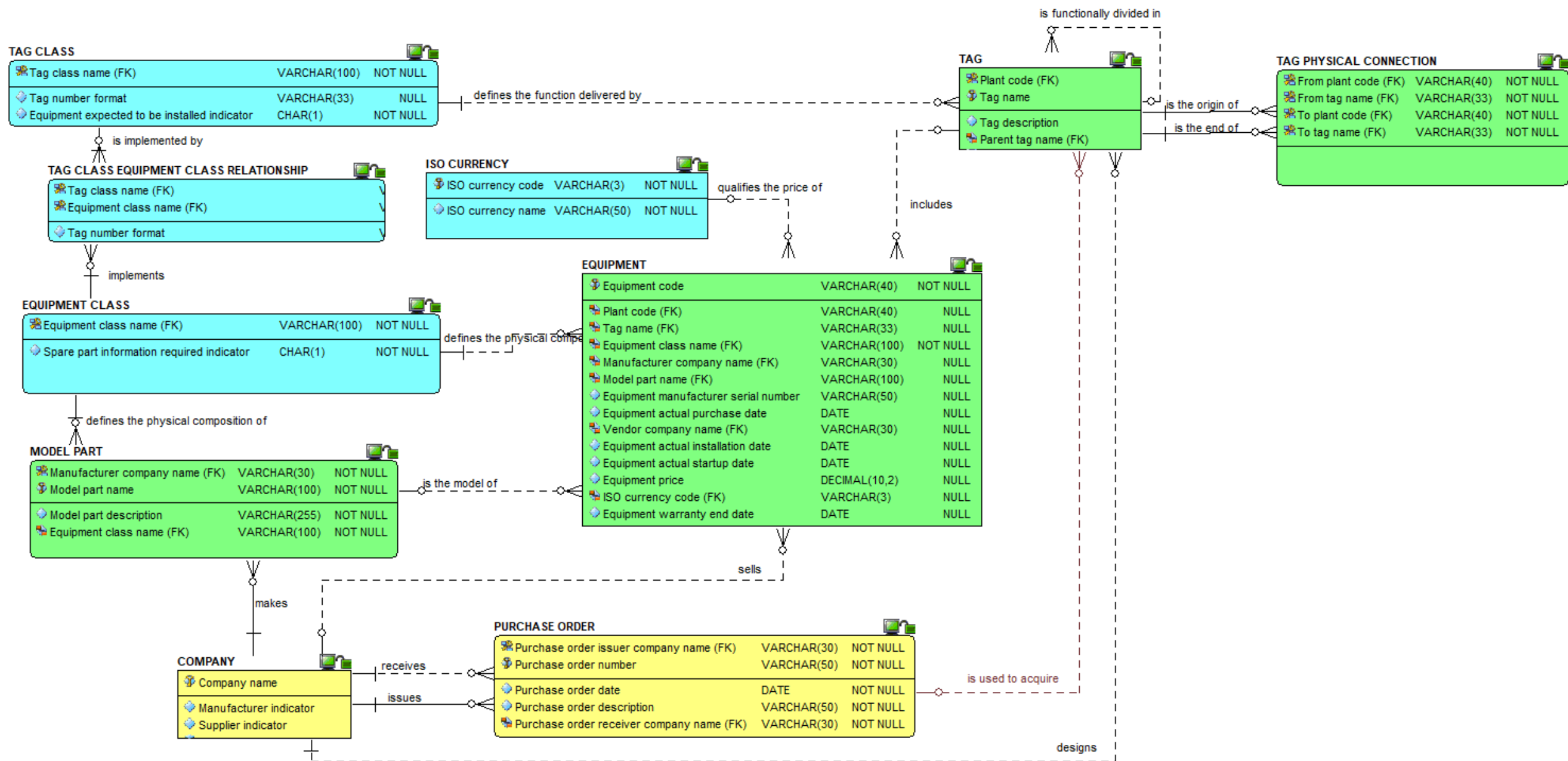
Tag to equipment : the relationships view



Tag to equipment : the definitions view

















Tag to equipment : the attributes view



Equipment attributes view

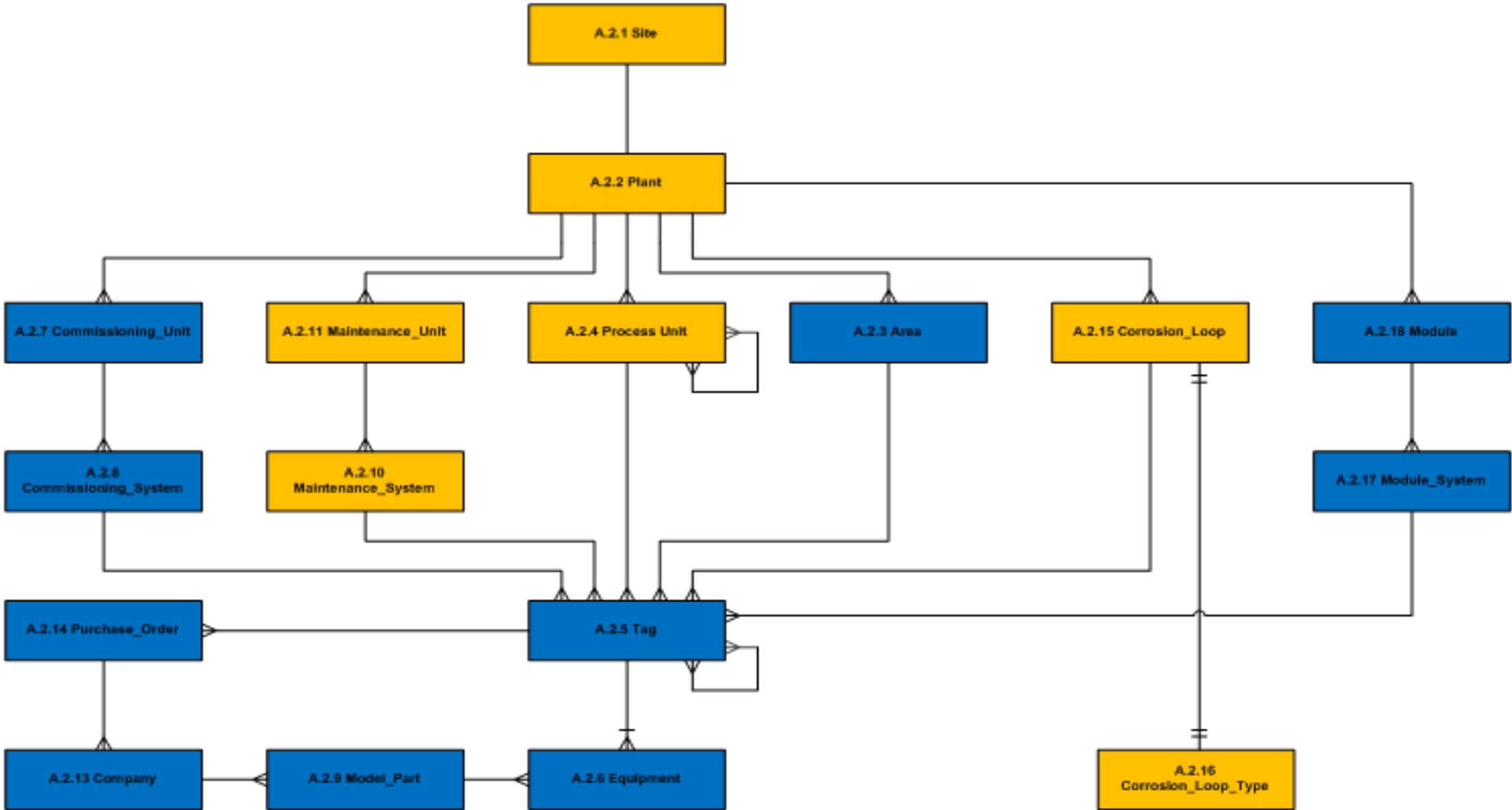
EQUIPMENT



 Equipment code	VARCHAR(40)	NOT NULL
 Plant code (FK)	VARCHAR(40)	NULL
 Tag name (FK)	VARCHAR(33)	NULL
 Equipment class name (FK)	VARCHAR(100)	NOT NULL
 Manufacturer company name (FK)	VARCHAR(30)	NULL
 Model part name (FK)	VARCHAR(100)	NULL
 Equipment manufacturer serial number	VARCHAR(50)	NULL
 Equipment actual purchase date	DATE	NULL
 Vendor company name (FK)	VARCHAR(30)	NULL
 Equipment actual installation date	DATE	NULL
 Equipment actual startup date	DATE	NULL
 Equipment price	DECIMAL(10,2)	NULL
 ISO currency code (FK)	VARCHAR(3)	NULL
 Equipment warranty end date	DATE	NULL

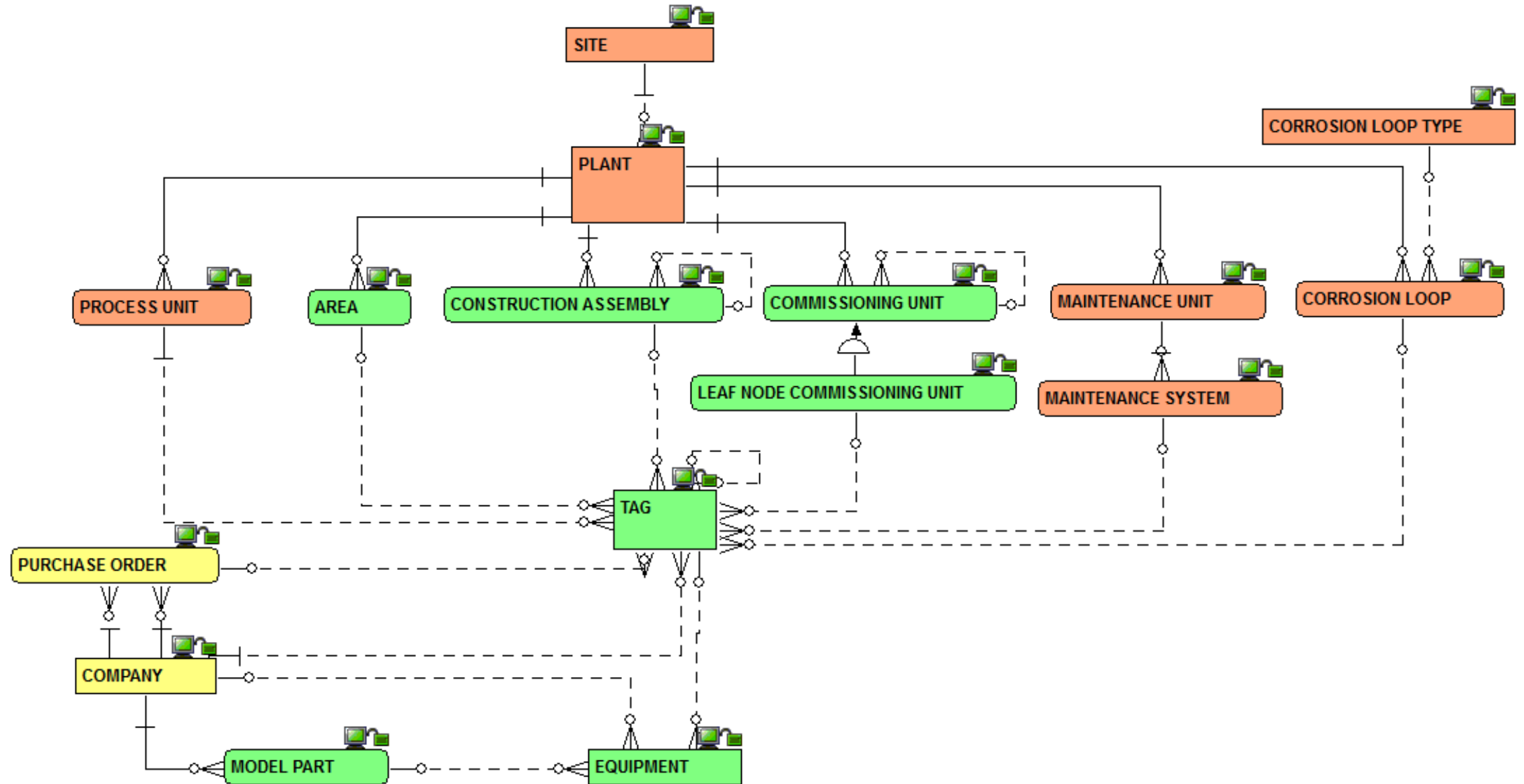
Checkpoint 1 : Summary after review of the first third of the data model

As was



Checkpoint 1 : Summary after review of the first third of the data model

As is



Solid line for identifying relationships, dashed line for non identifying ones

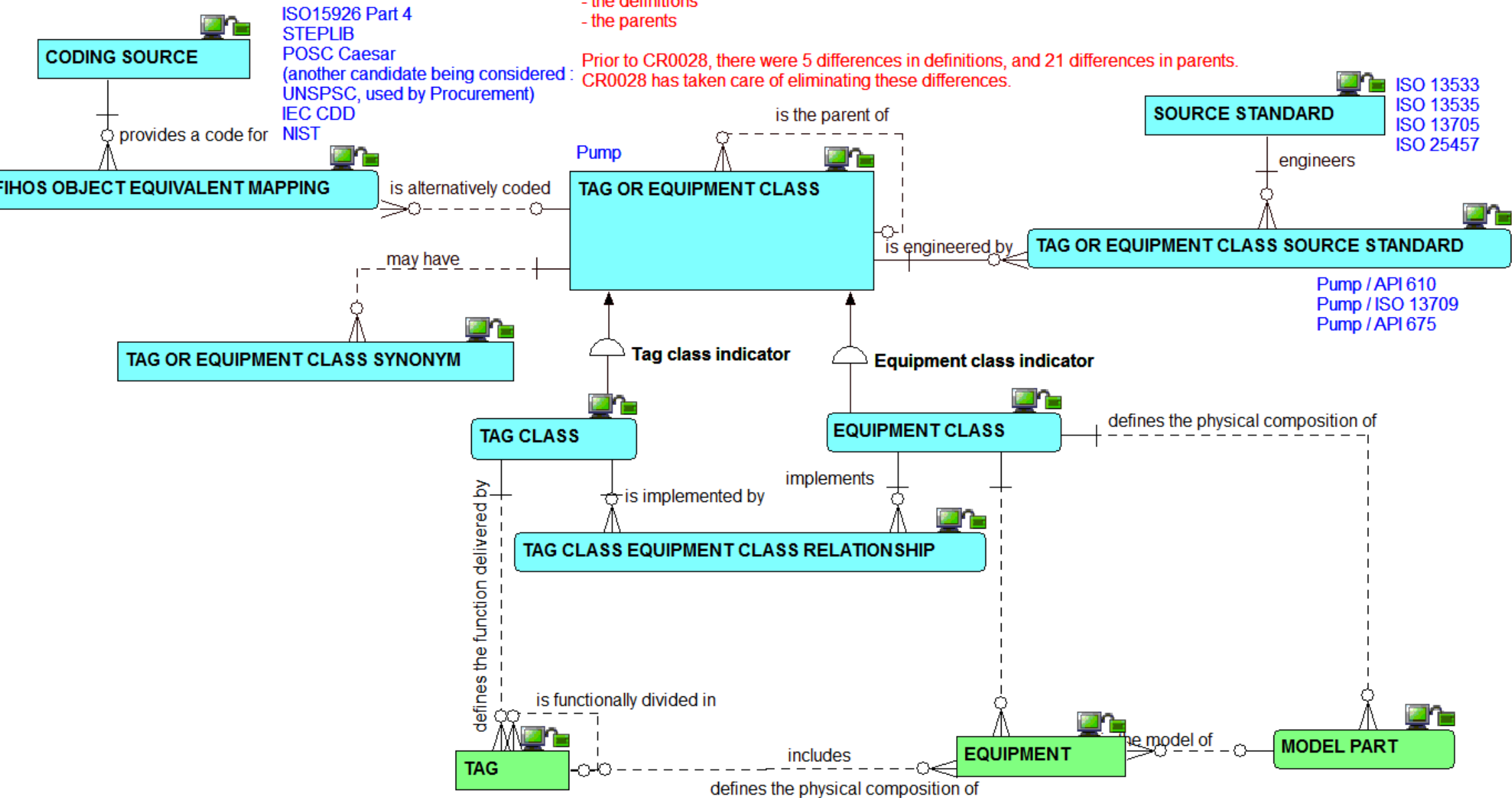
Classes : the relationships view

Over 80% of the classes are at the same time a tag class and an equipment class.

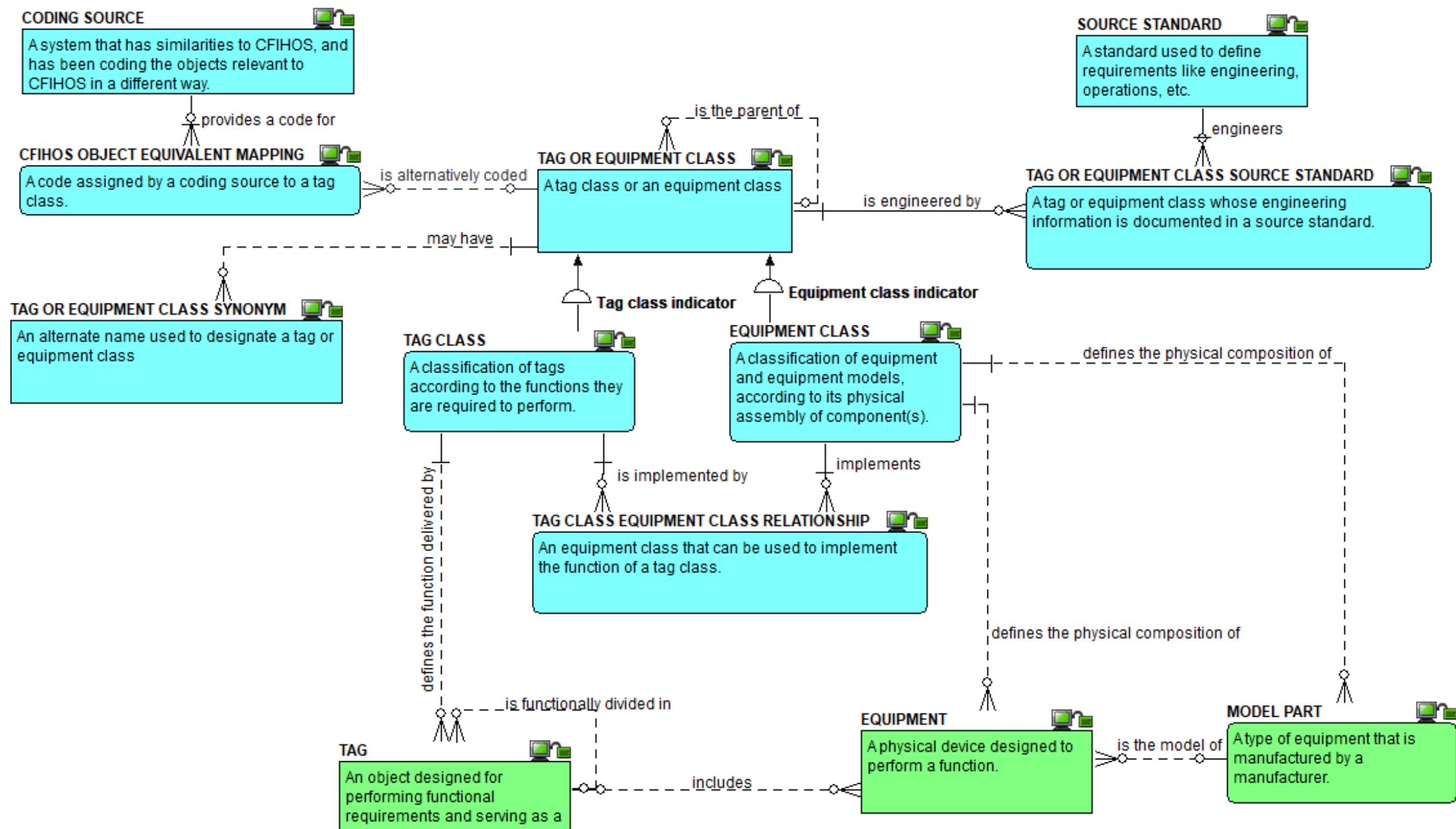
Implementing this structure avoids in the future differences in :

- the definitions
- the parents

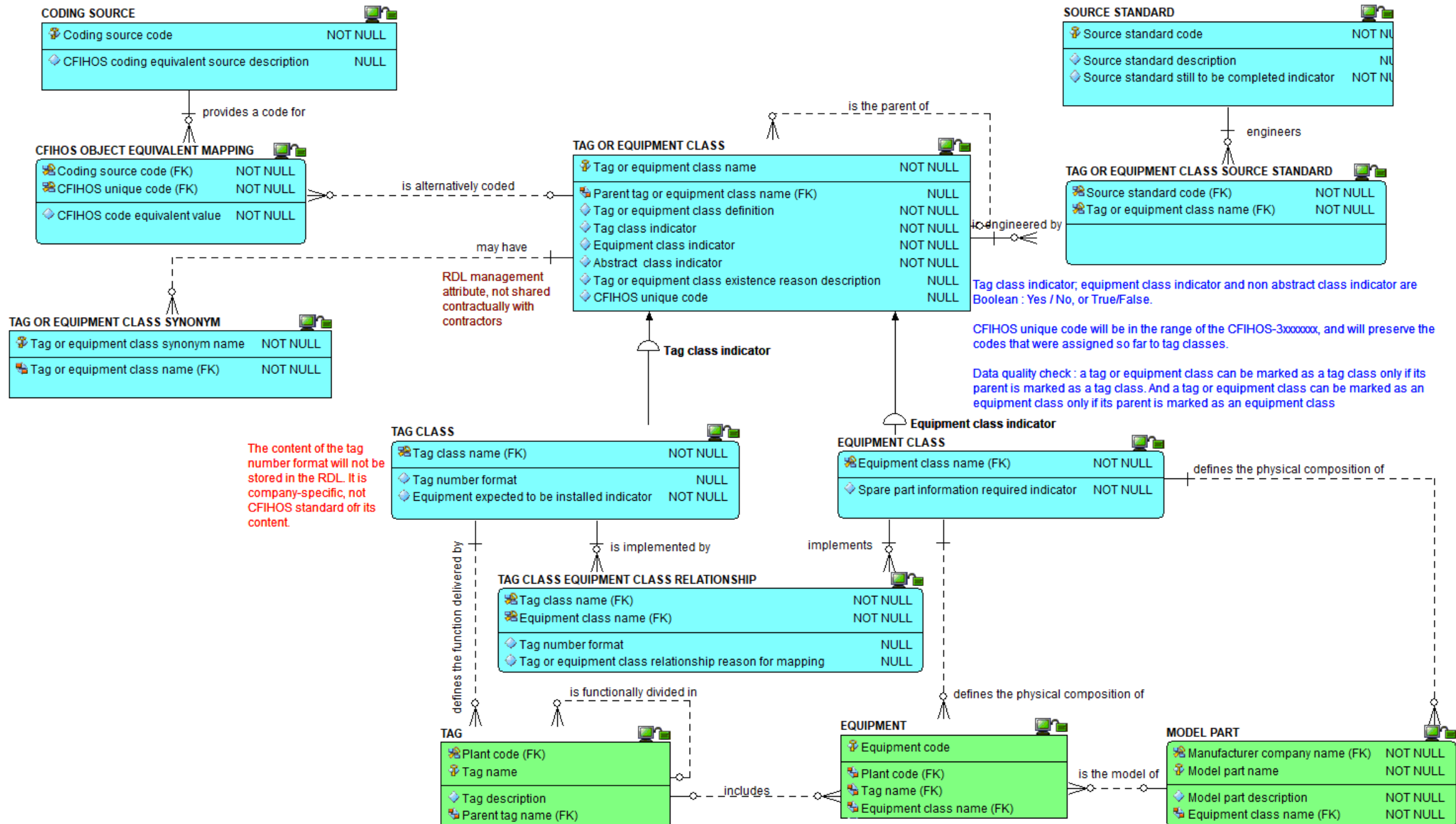
Prior to CR0028, there were 5 differences in definitions, and 21 differences in parents.
CR0028 has taken care of eliminating these differences.



Classes: the definitions view



Classes: the attributes view

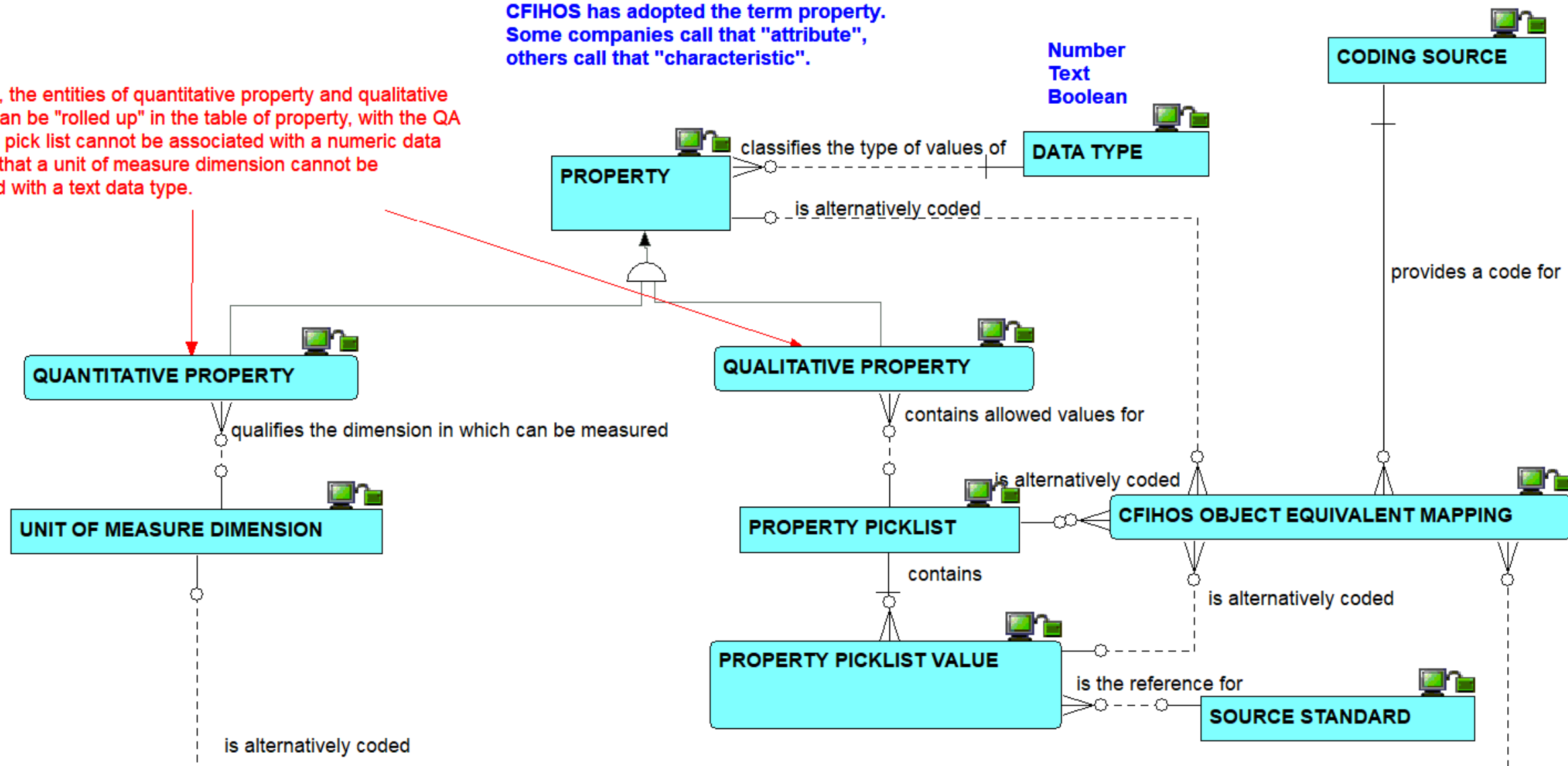


Properties: the conceptual view on relationships

This a conceptual view of the data

CFIHOS has adopted the term property.
Some companies call that "attribute",
others call that "characteristic".

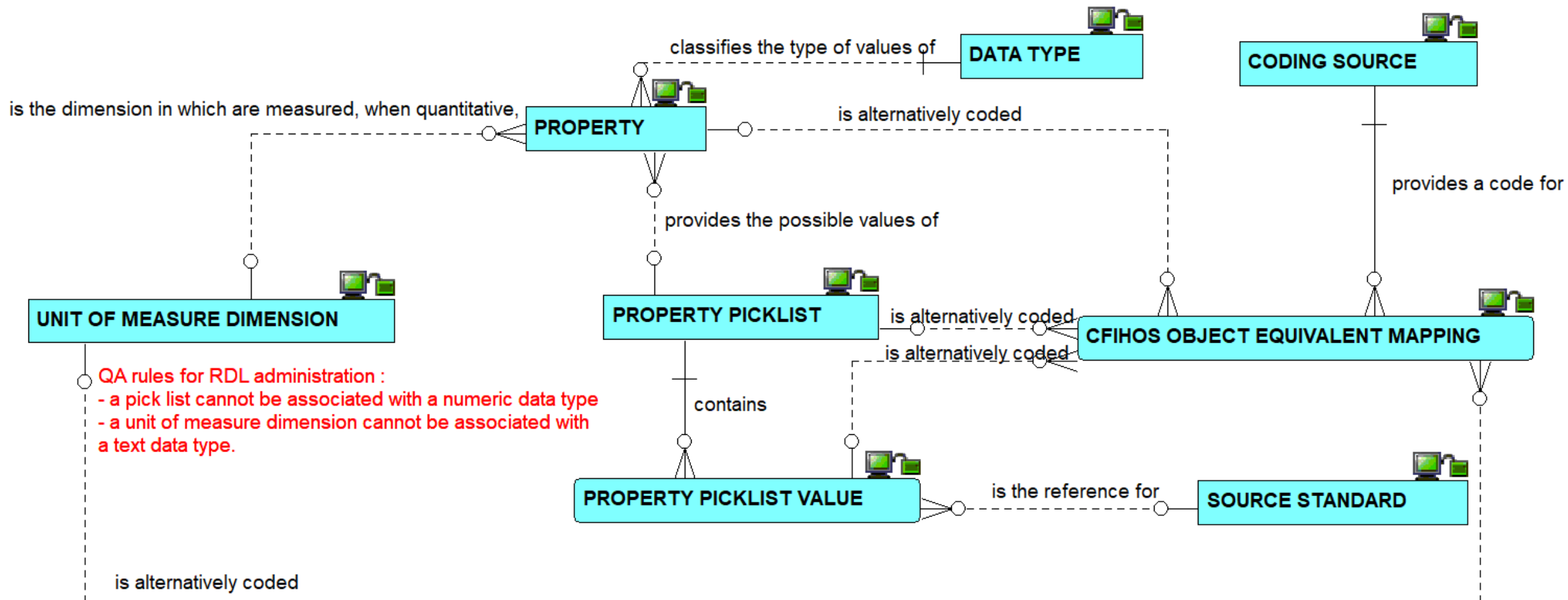
Physically, the entities of quantitative property and qualitative property can be "rolled up" in the table of property, with the QA rule that a pick list cannot be associated with a numeric data type, and that a unit of measure dimension cannot be associated with a text data type.



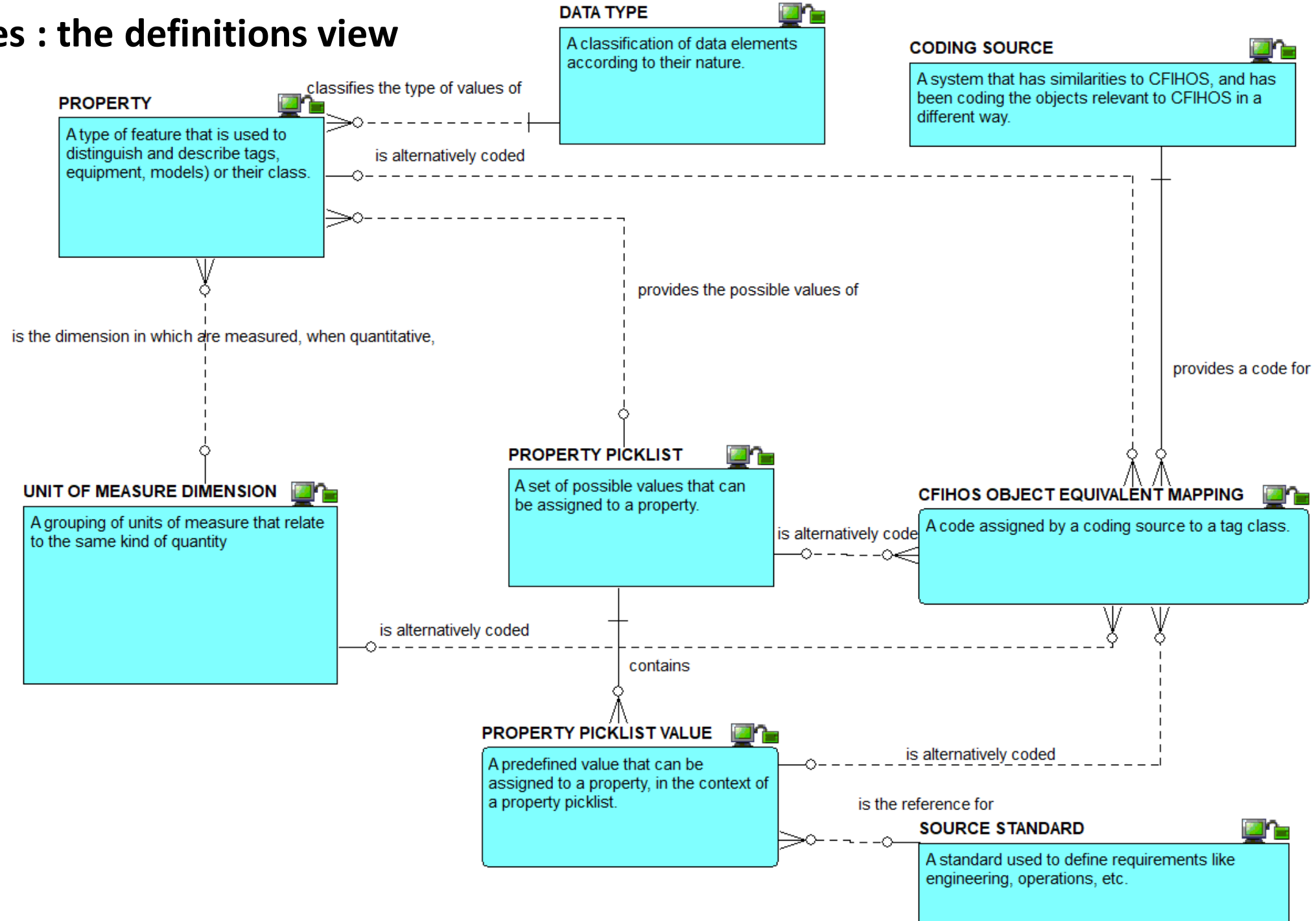
Properties: the logical view on relationships

This a logical view of the data

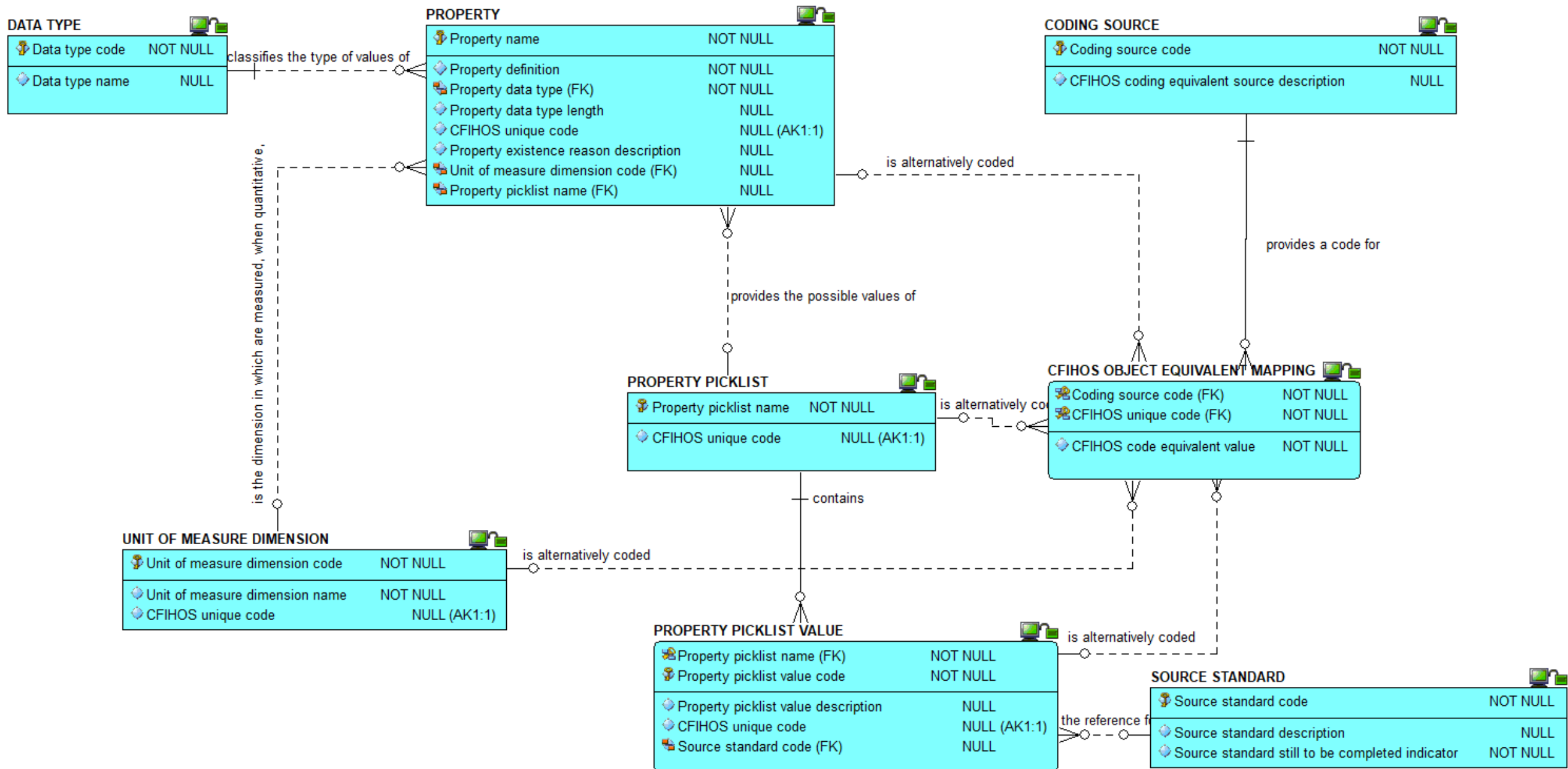
CFIHOS v1.4 current set of properties are not just properties as encountered in Steplib or in ISO15926-4. They also include component information or additional qualifier. The model should be refined, and the data content adjusted. This will most likely be progressed in the context of v1.5



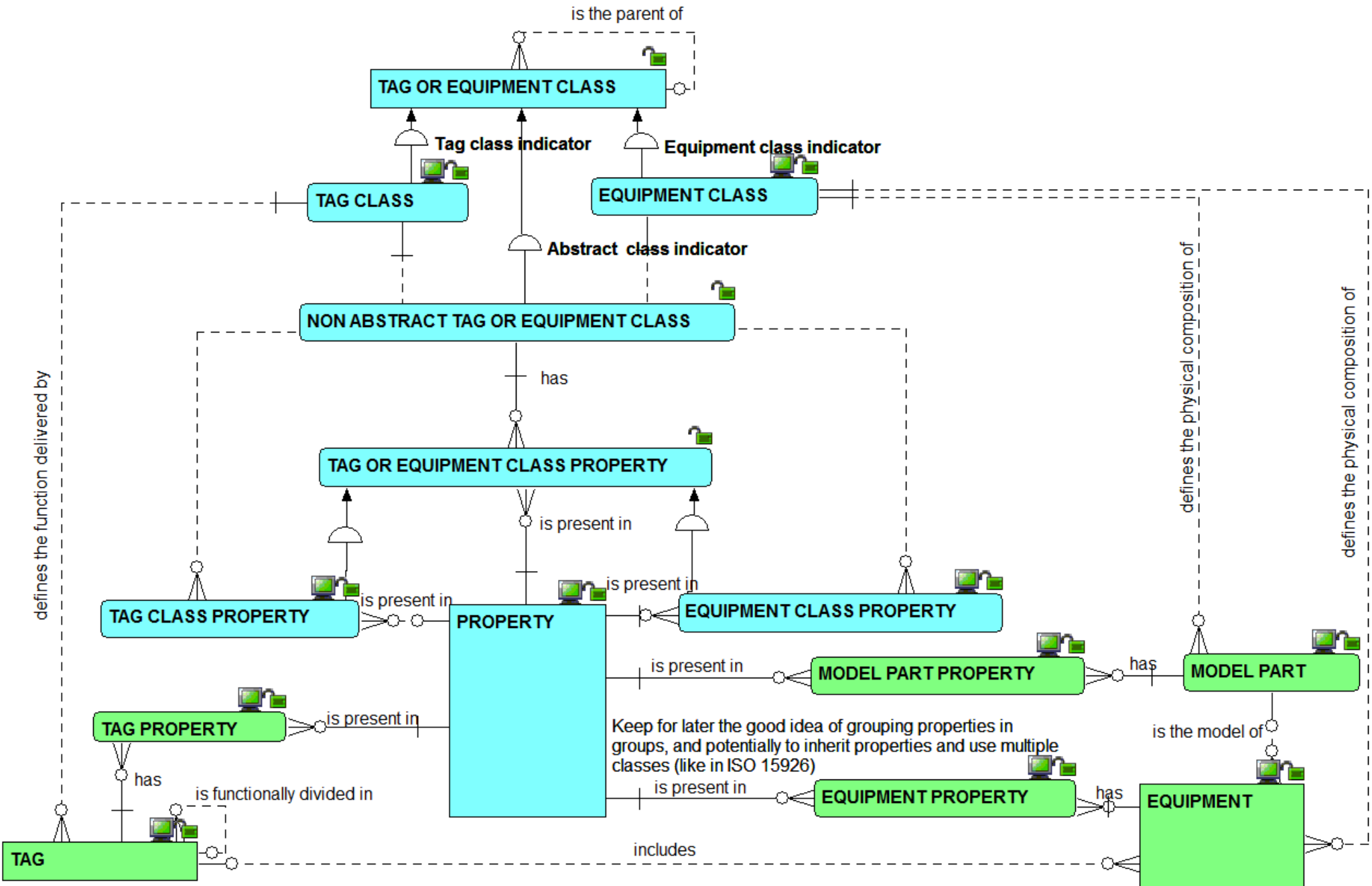
Properties : the definitions view



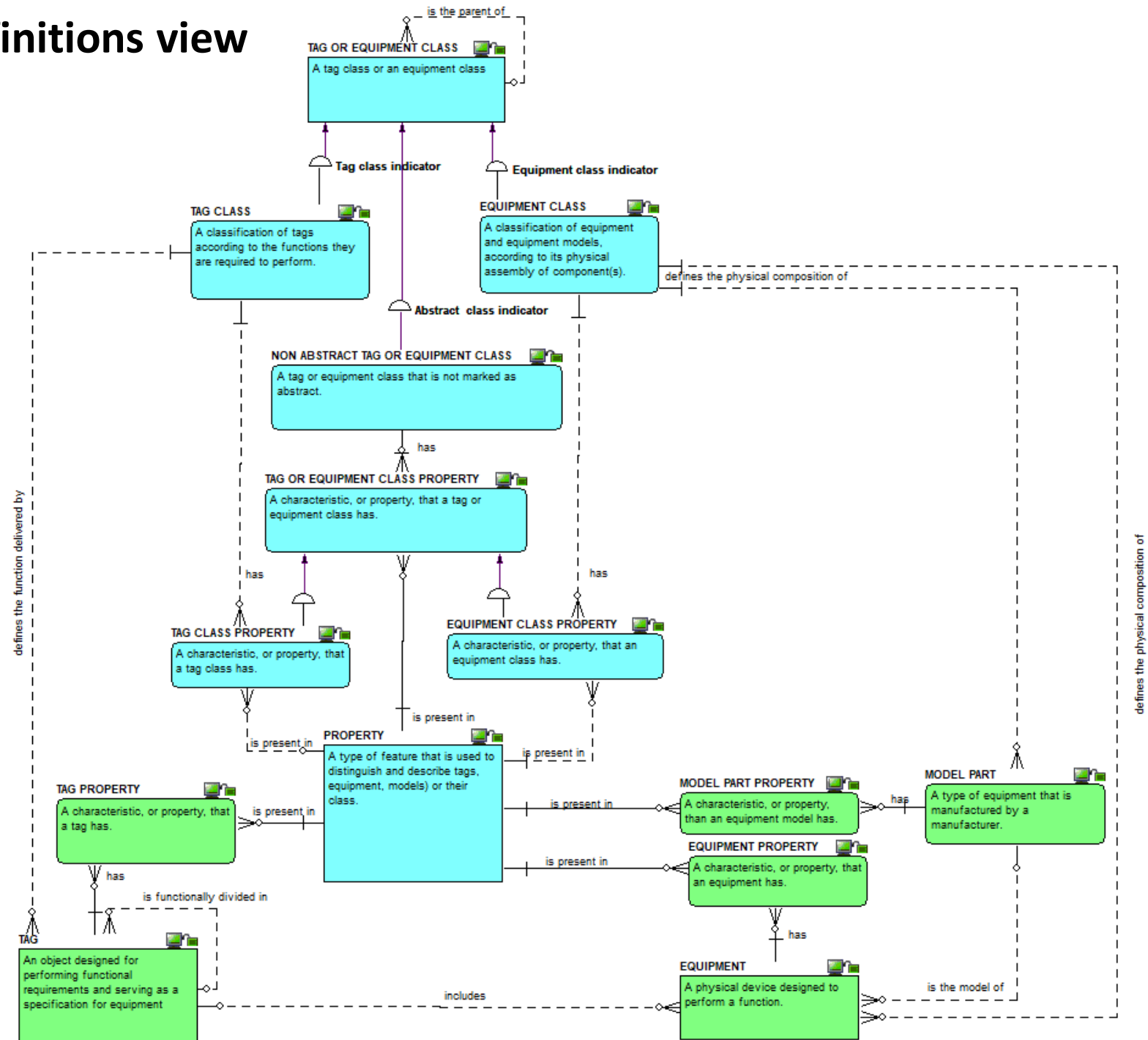
Properties : the attributes view



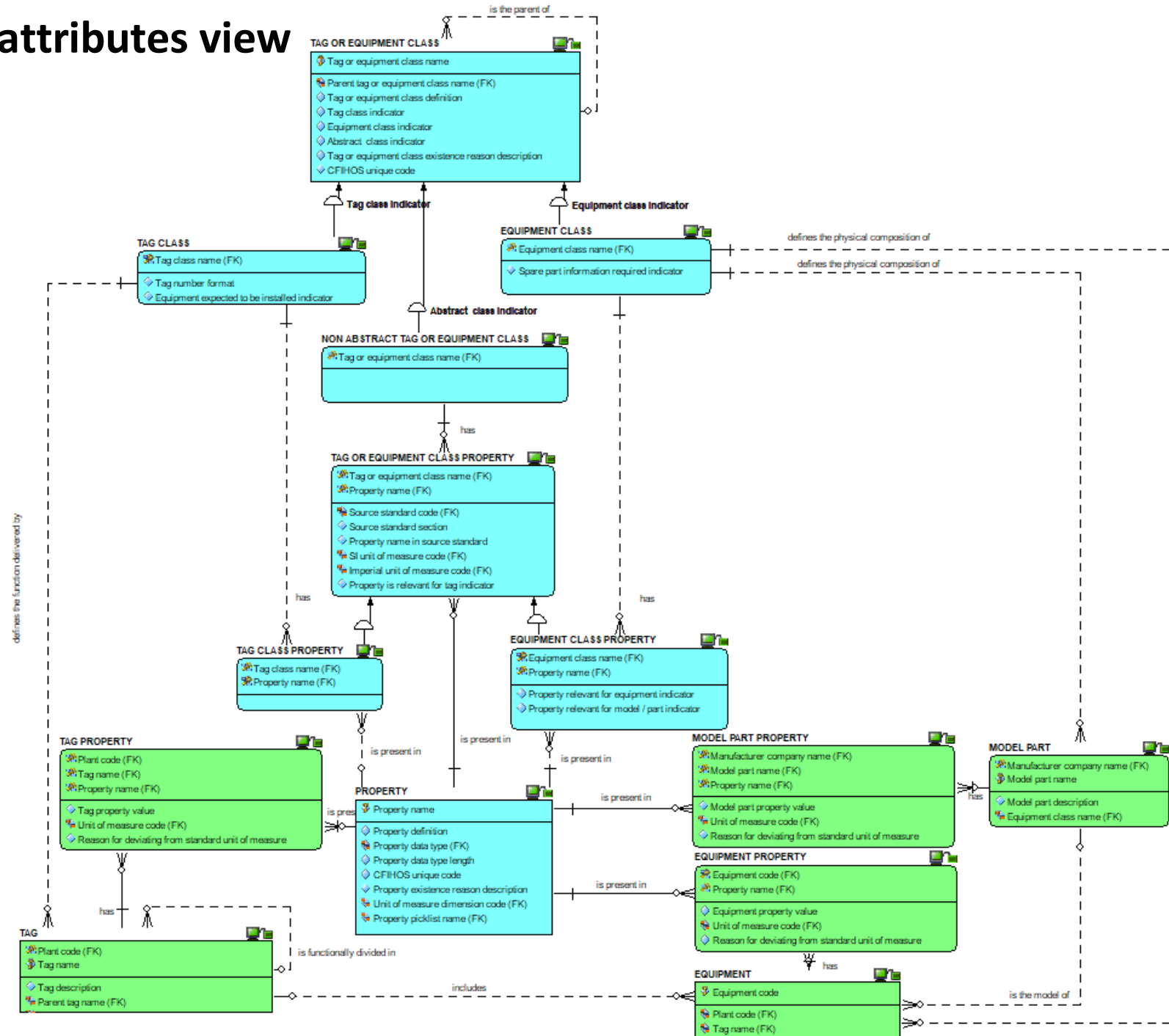
Property use : the relationships view



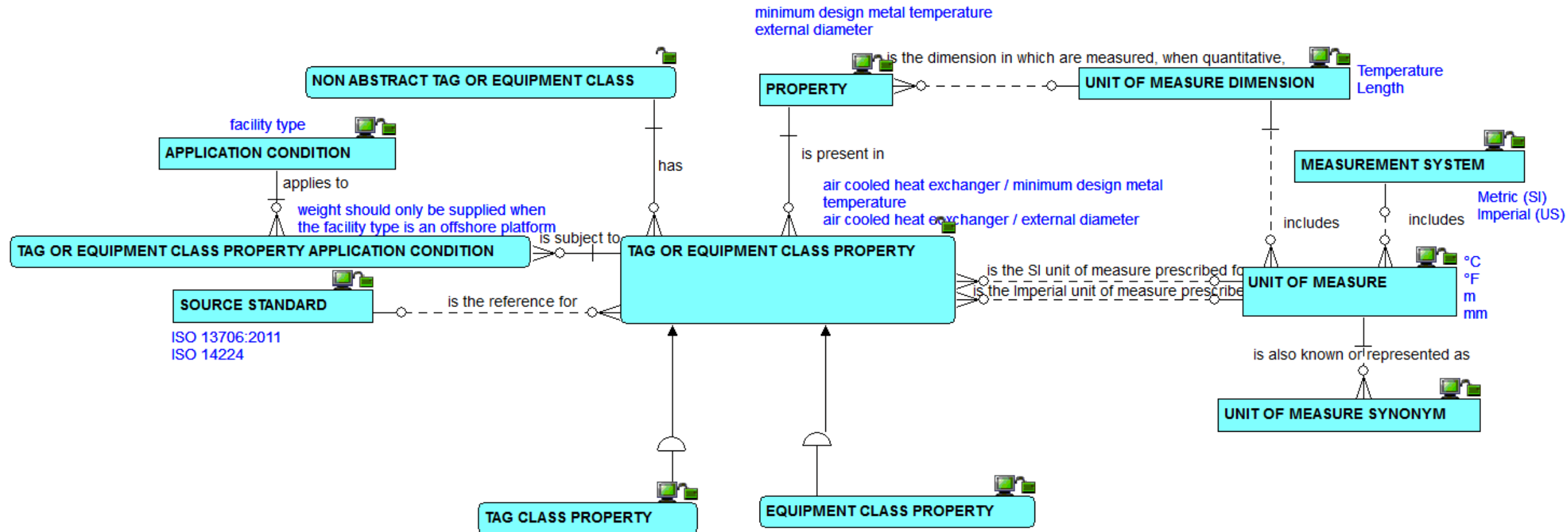
Property use : the definitions view



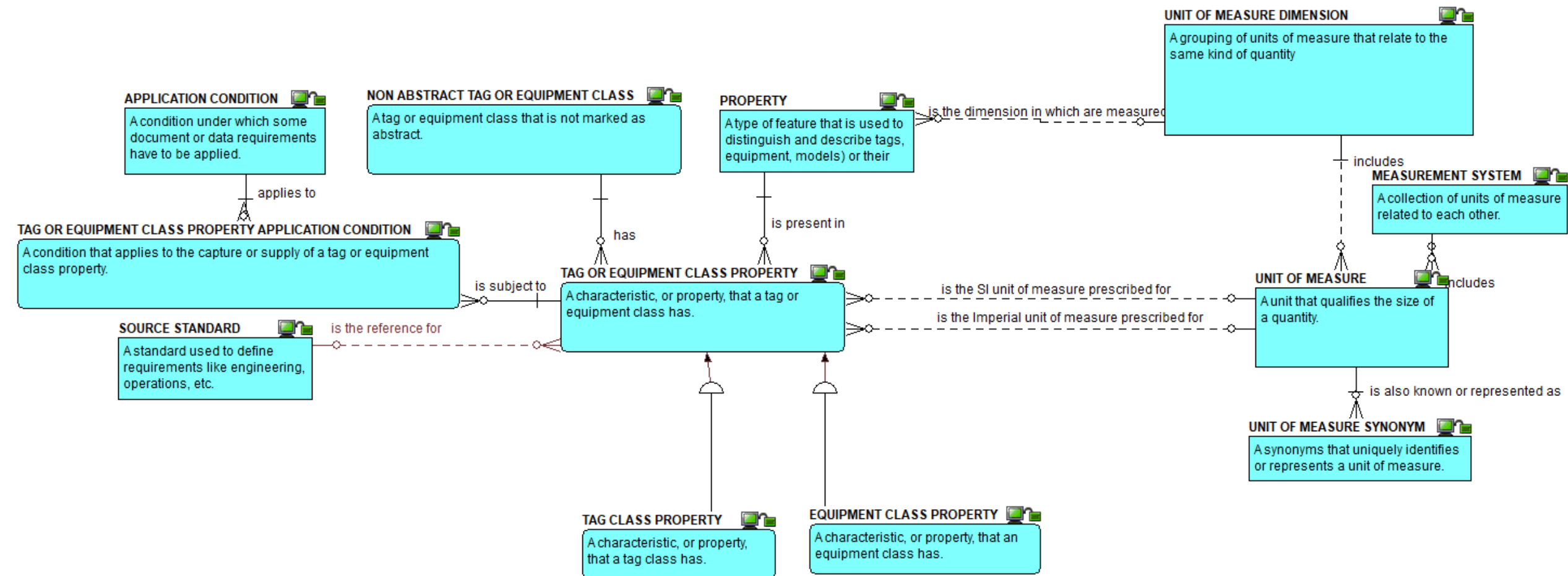
Property use : the attributes view



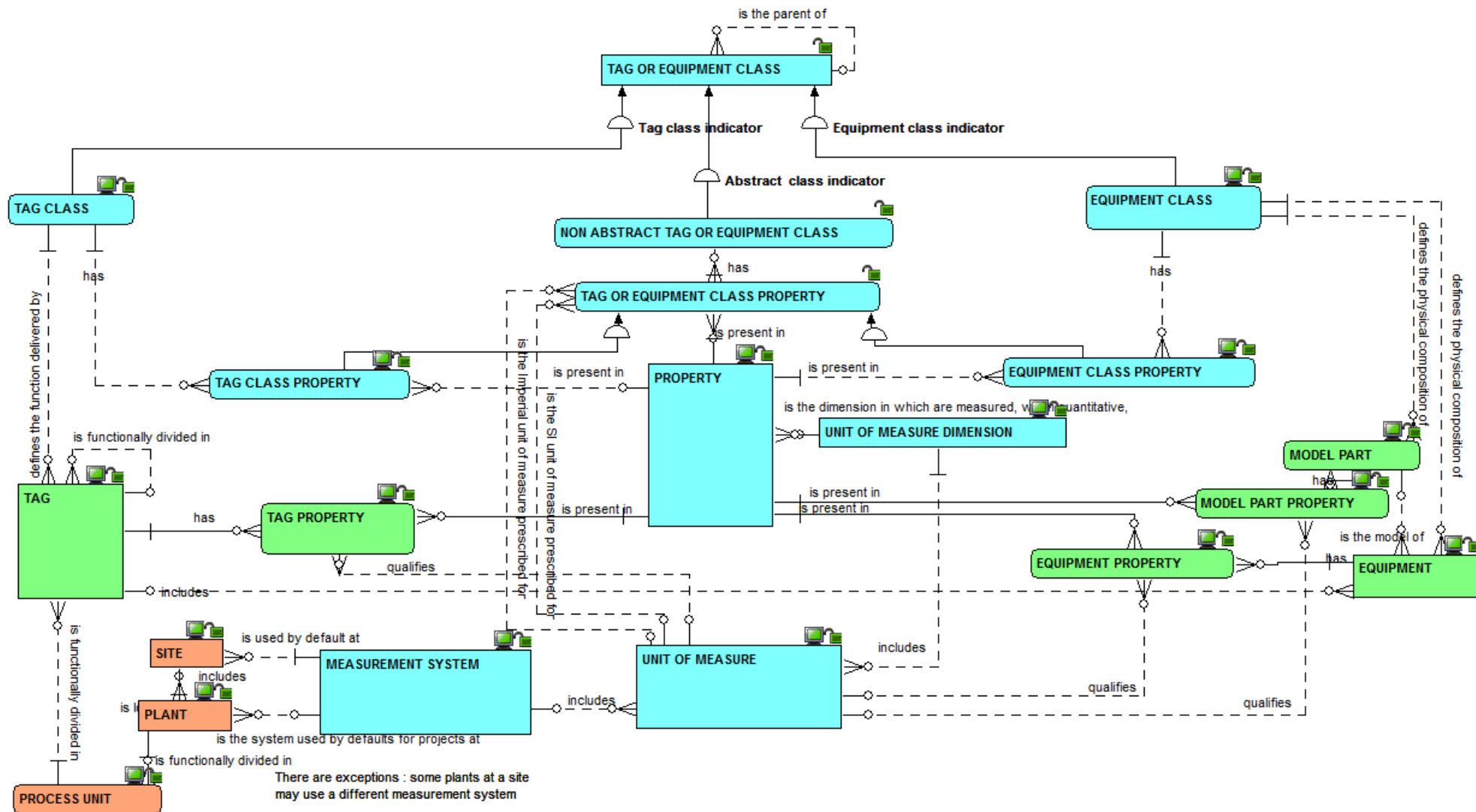
Properties, classes and units of measure : the relationships view



Properties, classes and units of measure : the definitions view



Properties, tags, equipment and units of measure : the relationships view



Tag properties, provided for a given tag, should be for all properties relevant to the tag class the tag belongs to.

Tag properties should be expressed in the unit of measure prescribed by the sourced standard, in the measurement system that is used at the plant where the tag will be installed.

Deviations in the unit of measure in which the property of the tag should be expressed could be acceptable, but only if the dimension of the unit of measure used is the same as the dimension of the property.

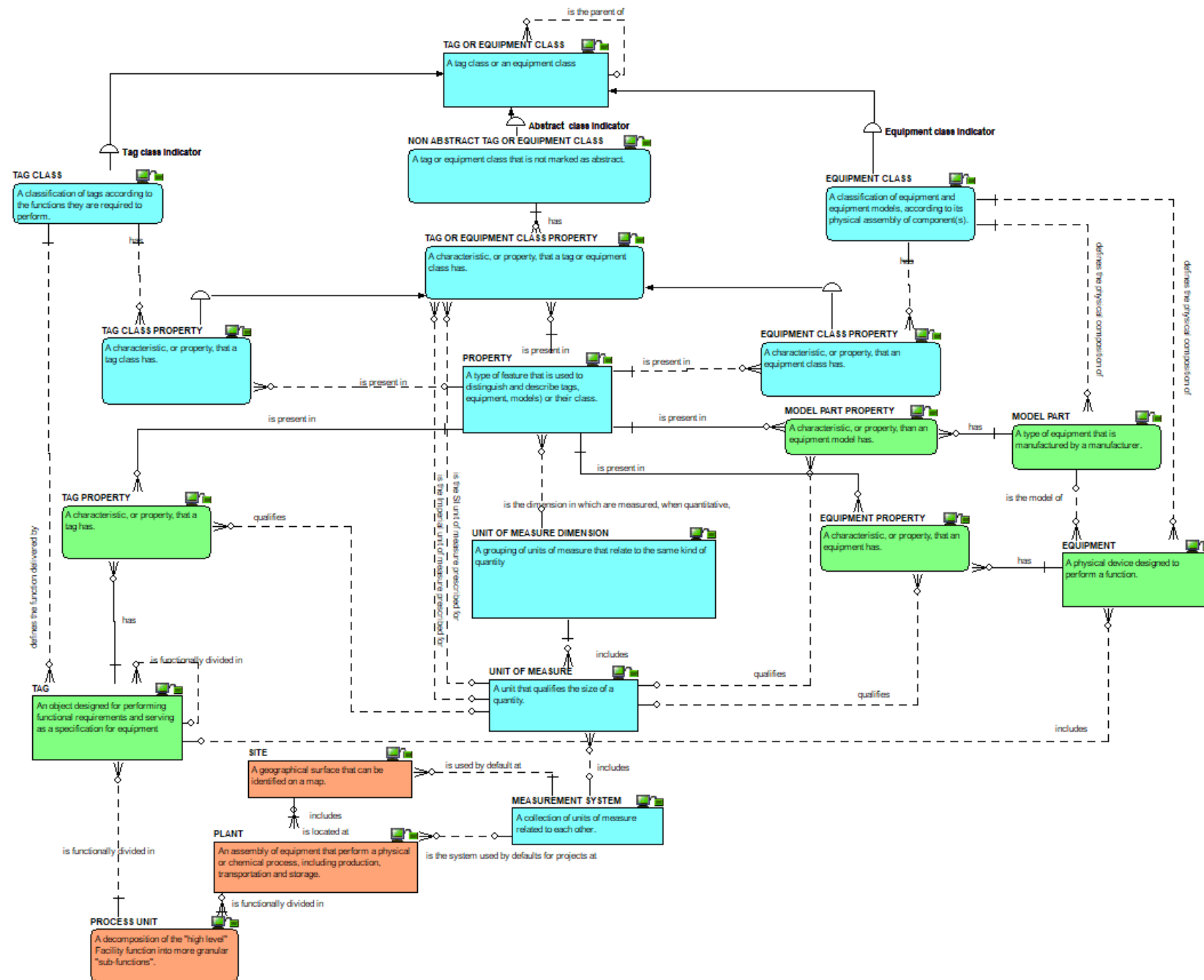
Equipment properties, provided for a given equipment, should be for all properties relevant to the equipment class the equipment belongs to, and marked as relevant to the equipment.

Model properties, provided for a given equipment, should be for all properties relevant to the equipment class the model belongs to, and marked as relevant to the model

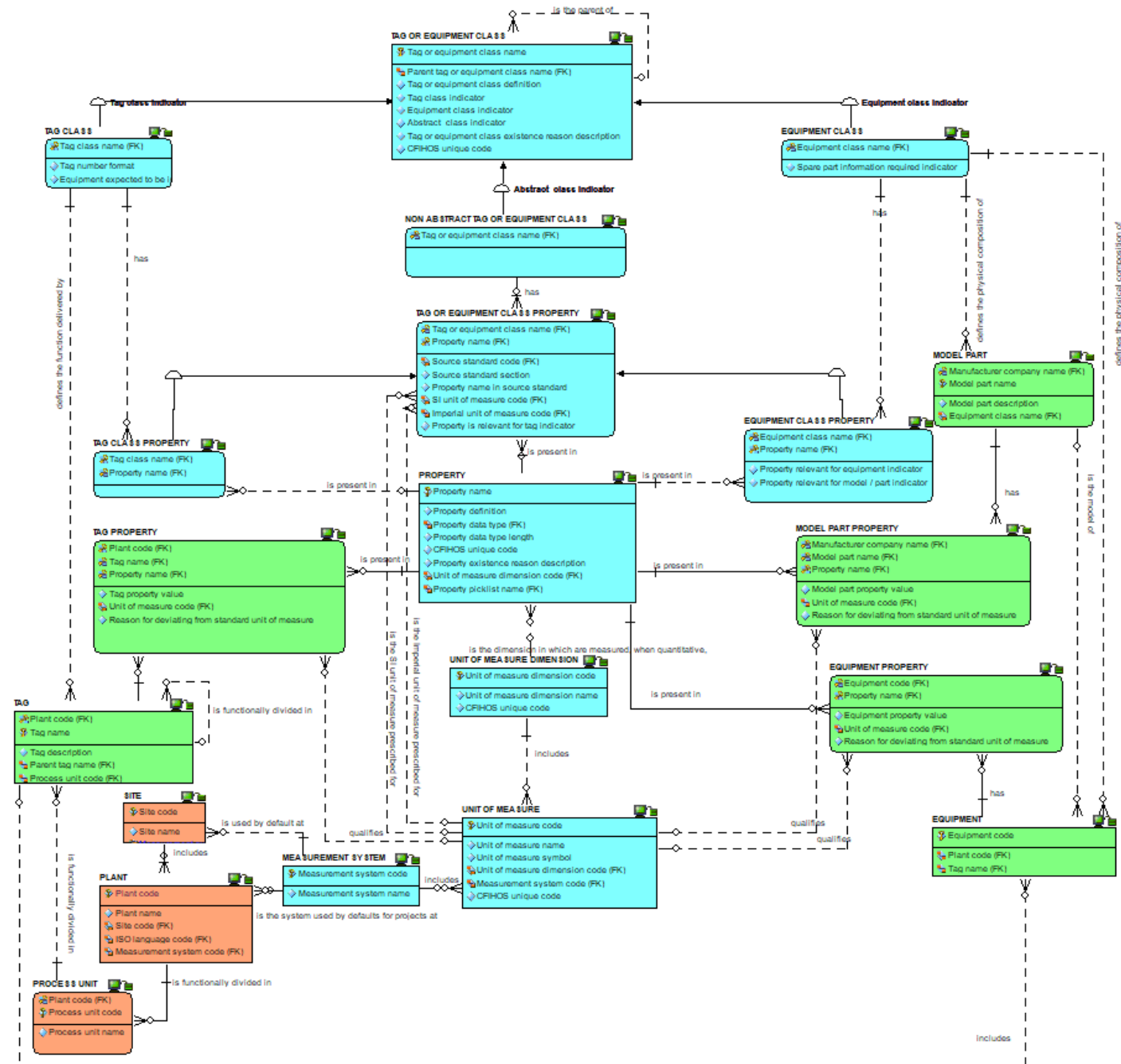
Equipment and model properties should be expressed in the unit of measure prescribed by the sourced standard, in the measurement system that is used at the plant where the equipment will be installed.

Deviations in the unit of measure in which the property of the equipment or model should be expressed could be acceptable, but only if the dimension of the unit of measure used is the same as the dimension of the property.

Properties, classes and units of measure : the definitions view

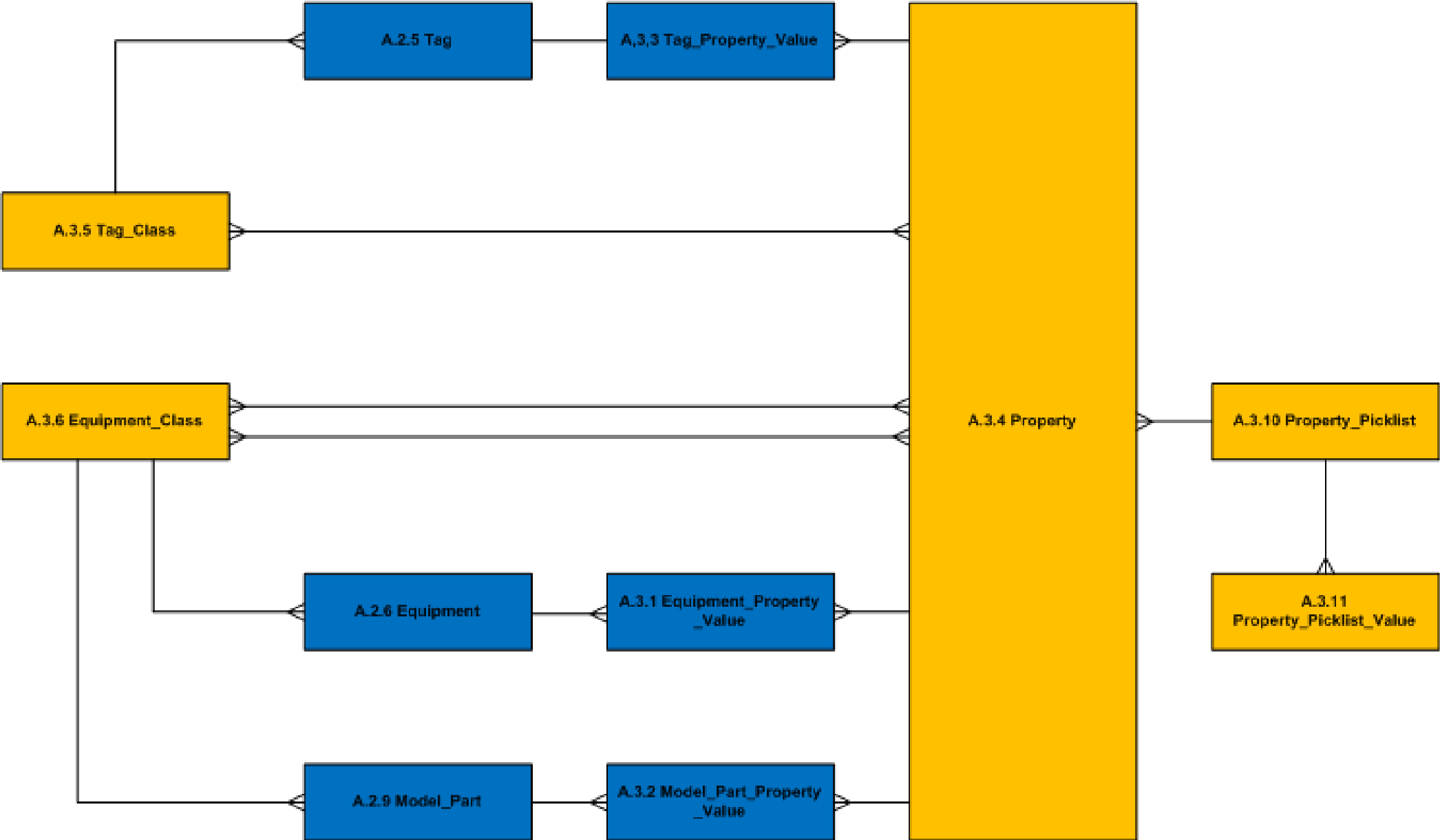


Properties, classes and units of measure : the attributes view



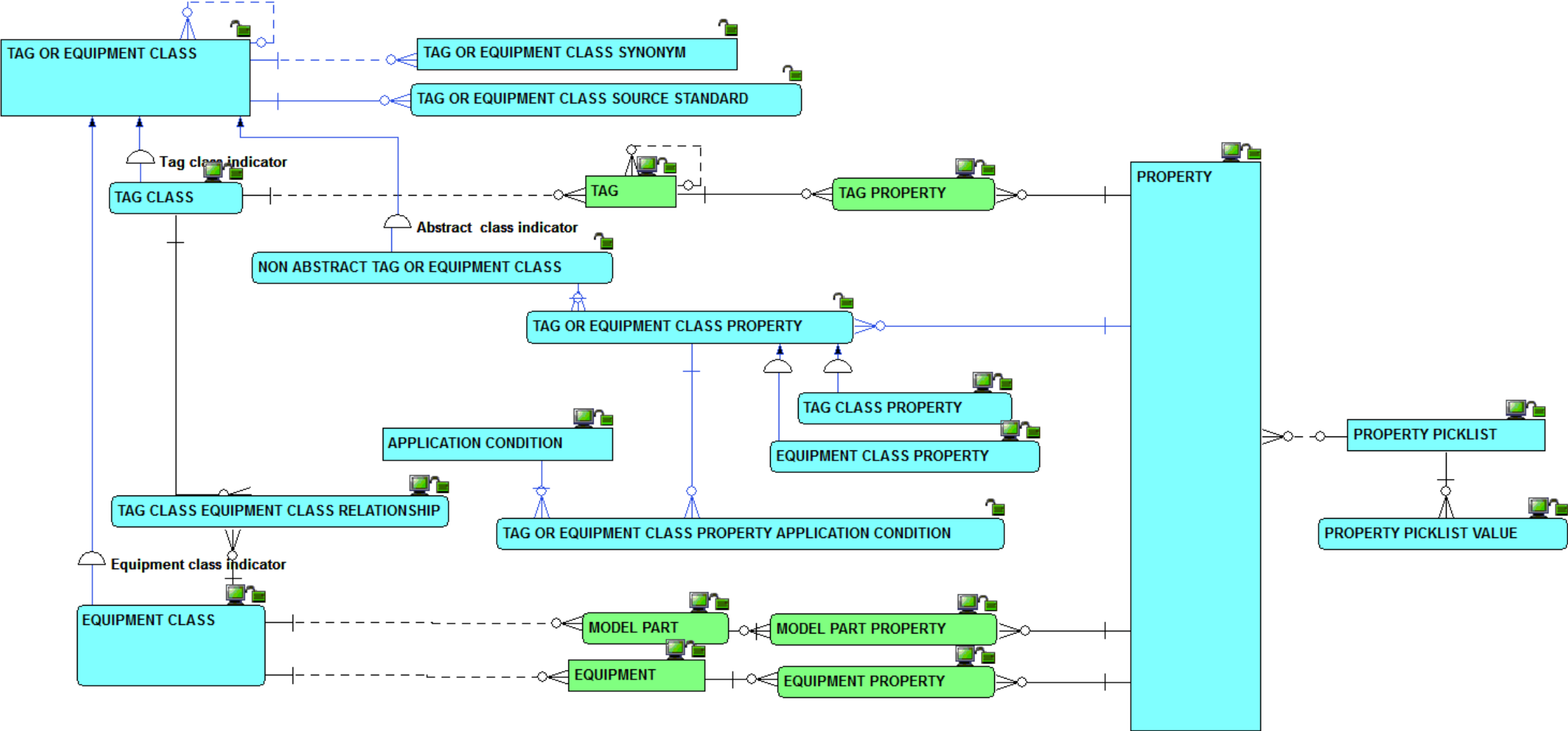
Checkpoint 2 : Summary after review of the second third of the data model

As was



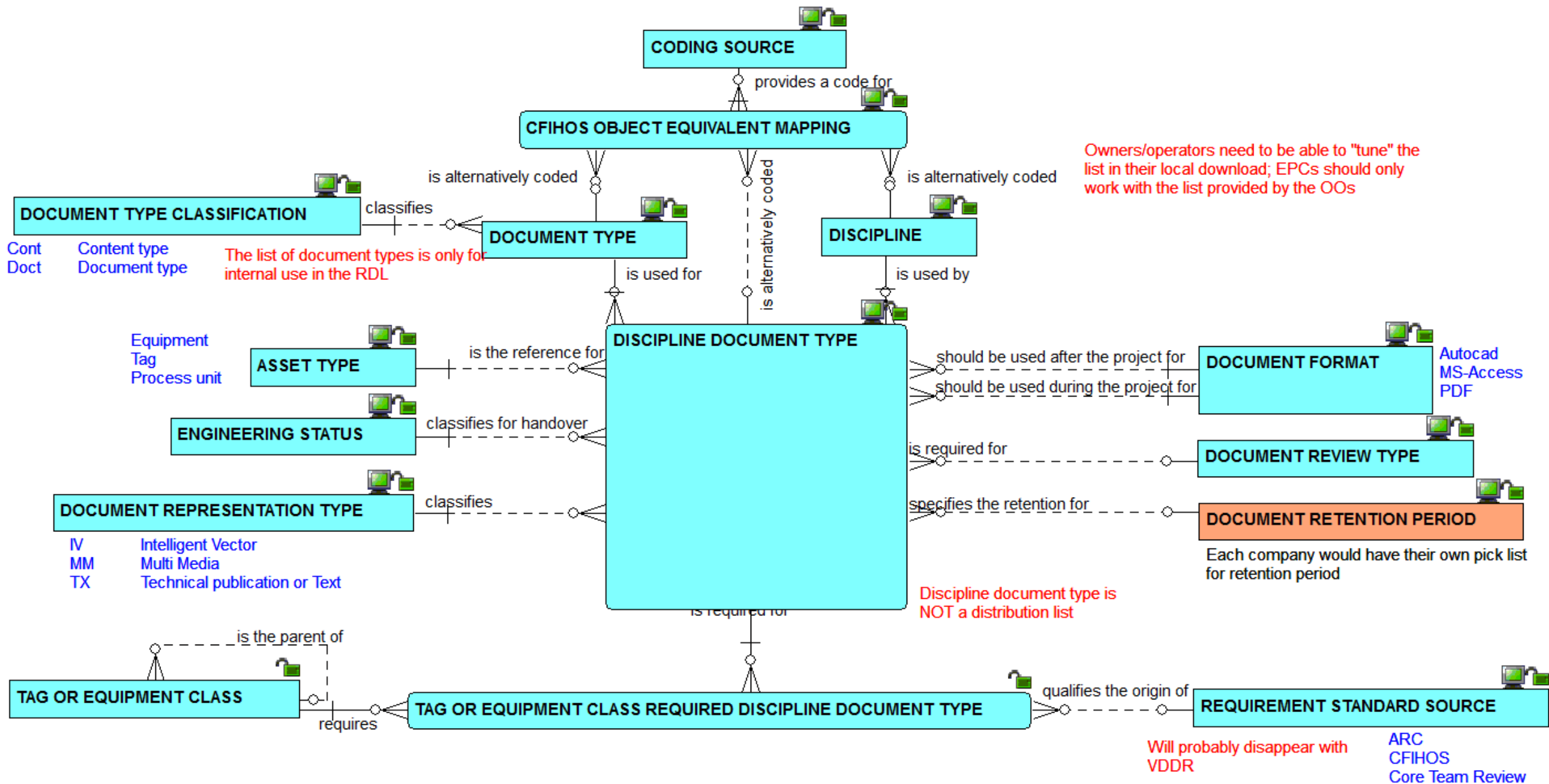
Checkpoint 2 : Summary after review of the second third of the data model

As is

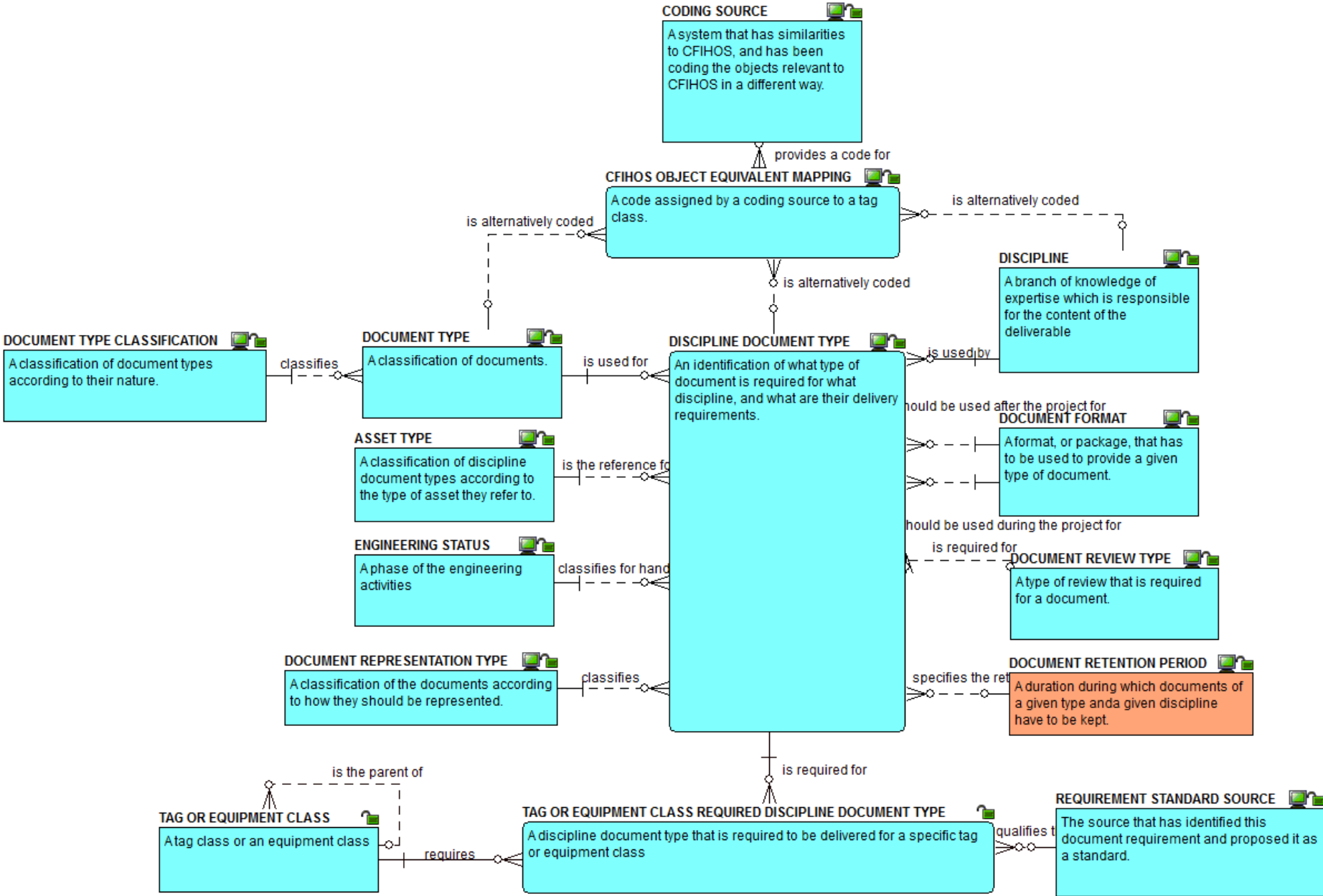


Solid line for identifying relationships, dashed line for non identifying ones

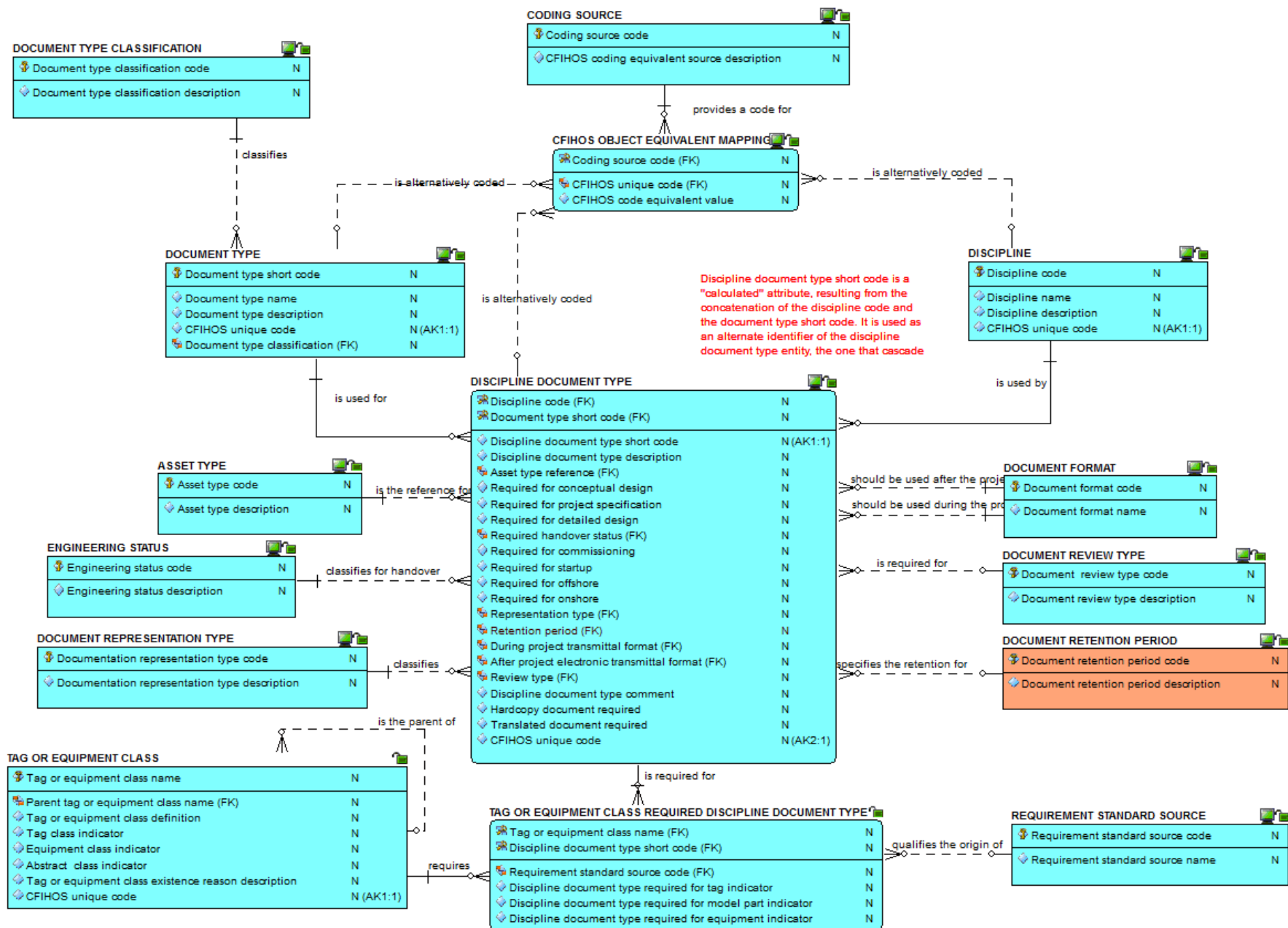
Disciplines and document types : the relationships view



Disciplines and document types : the definitions view

























Disciplines and document types : the attributes view



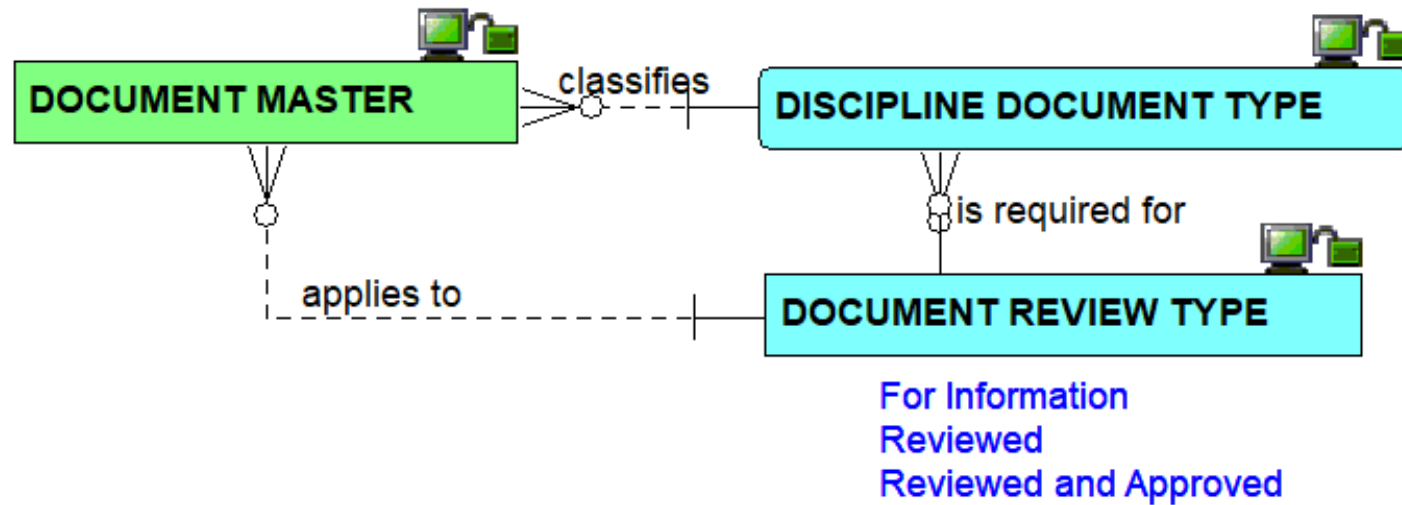
Discipline document type : zoom on the attributes

DISCIPLINE DOCUMENT TYPE

 Discipline code (FK)	N
 Document type short code (FK)	N
 Discipline document type short code	N
 Discipline document type description	N
 Asset type reference (FK)	N
 Required for conceptual design	N
 Required for project specification	N
 Required for detailed design	N
 Required handover status (FK)	N
 Required for commissioning	N
 Required for startup	N
 Required for offshore	N
 Required for onshore	N
 Representation type (FK)	N
 Retention period (FK)	N
 During project transmittal format (FK)	N
 After project electronic transmittal format (FK)	N
 Review type (FK)	N
 Discipline document type comment	N
 Hardcopy document required	N
 Translated document required	N
 CFIHOS unique code	N

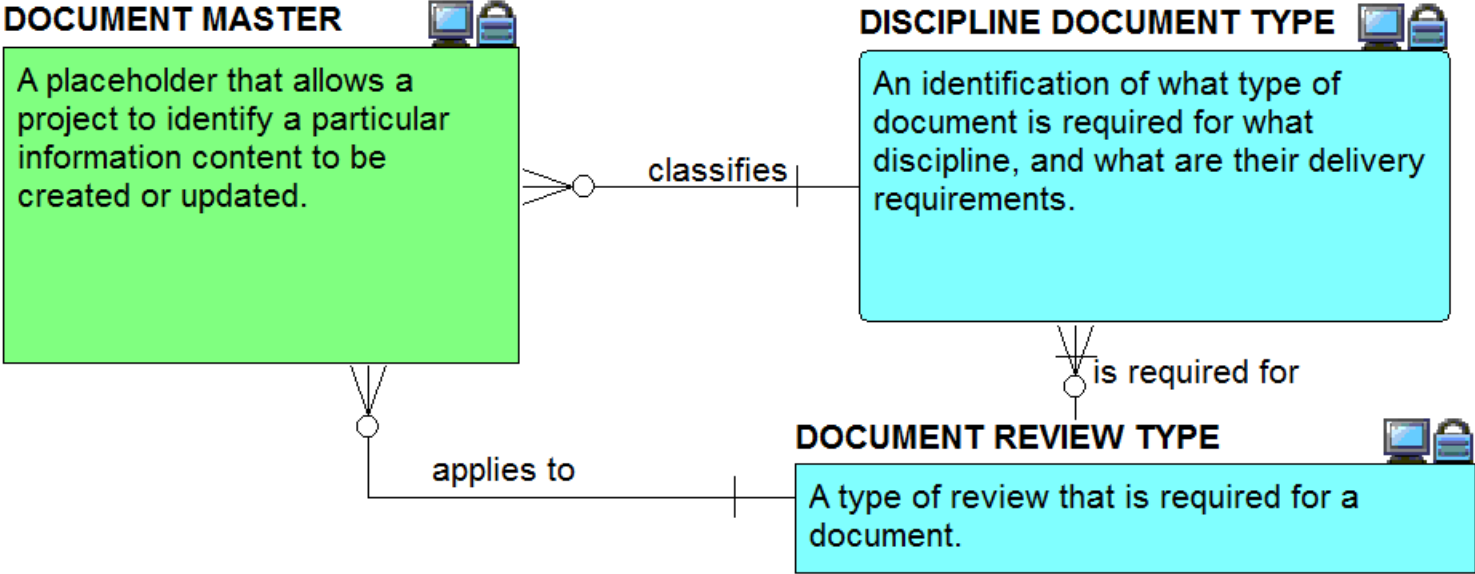
Discipline document type short code is a "calculated" attribute, resulting from the concatenation of the discipline code and the document type short code. It is used as an alternate identifier of the discipline document type entity, the one that cascade in other entities like the document master.

Document master : the relationships view



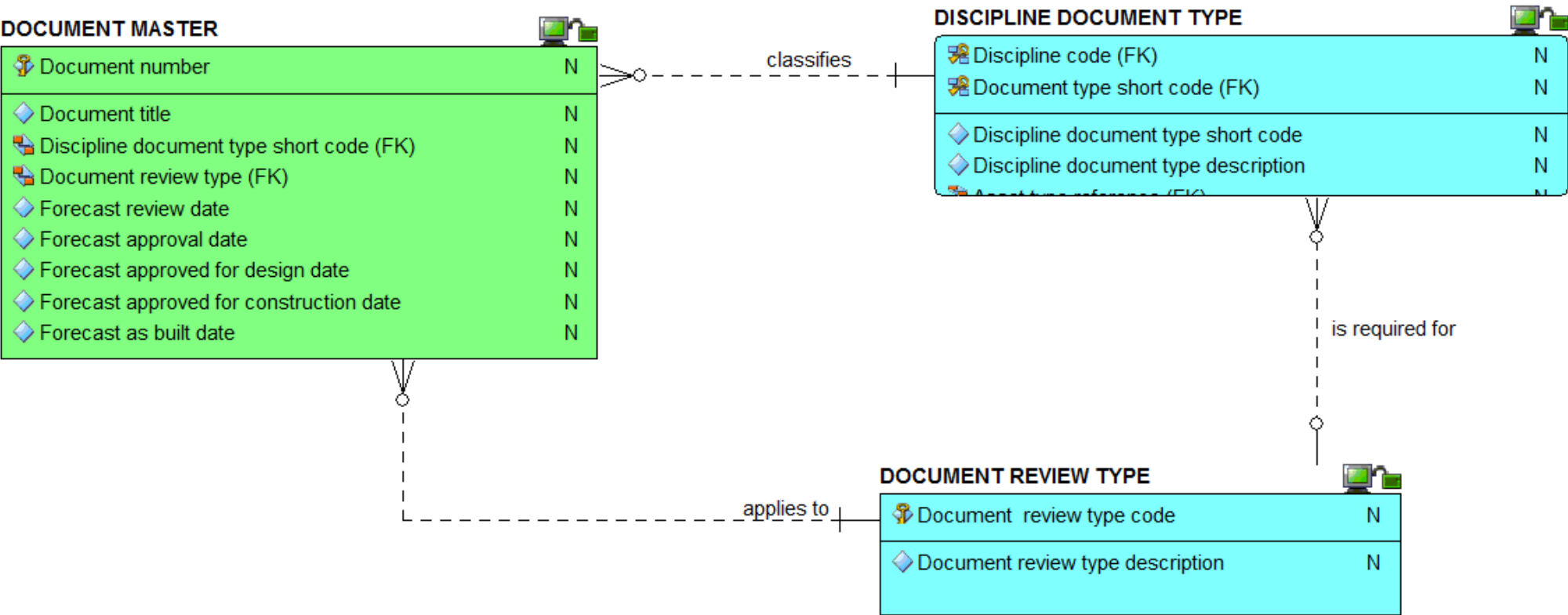
Each document is associated with a unique discipline and document type. These then determine the tags of what classes need to be reported in the various revisions of the document, provided that these tags are at the plant / plant area / process unit referred to in the document revision.

Document master : the definitions view

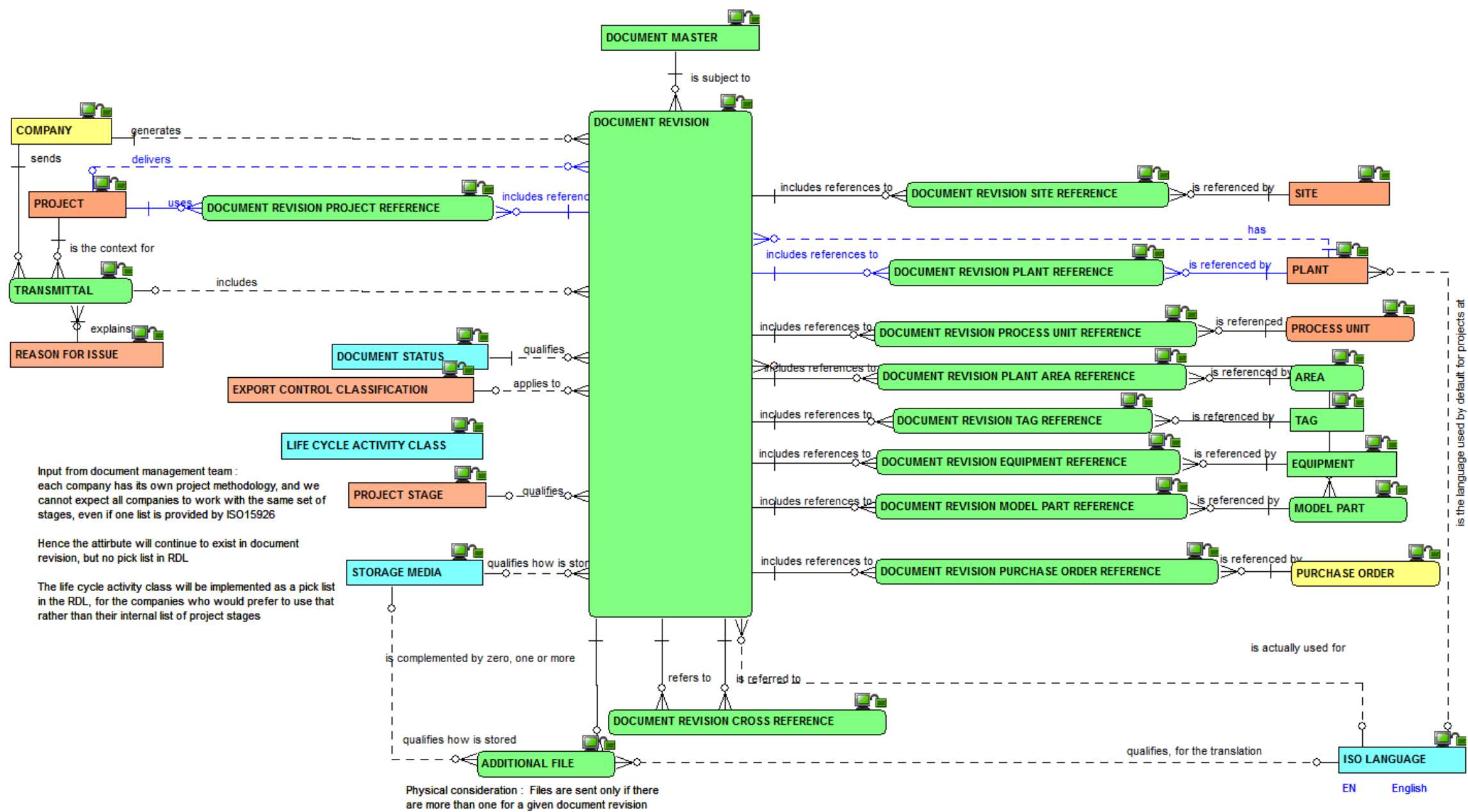


Document master : the attributes view

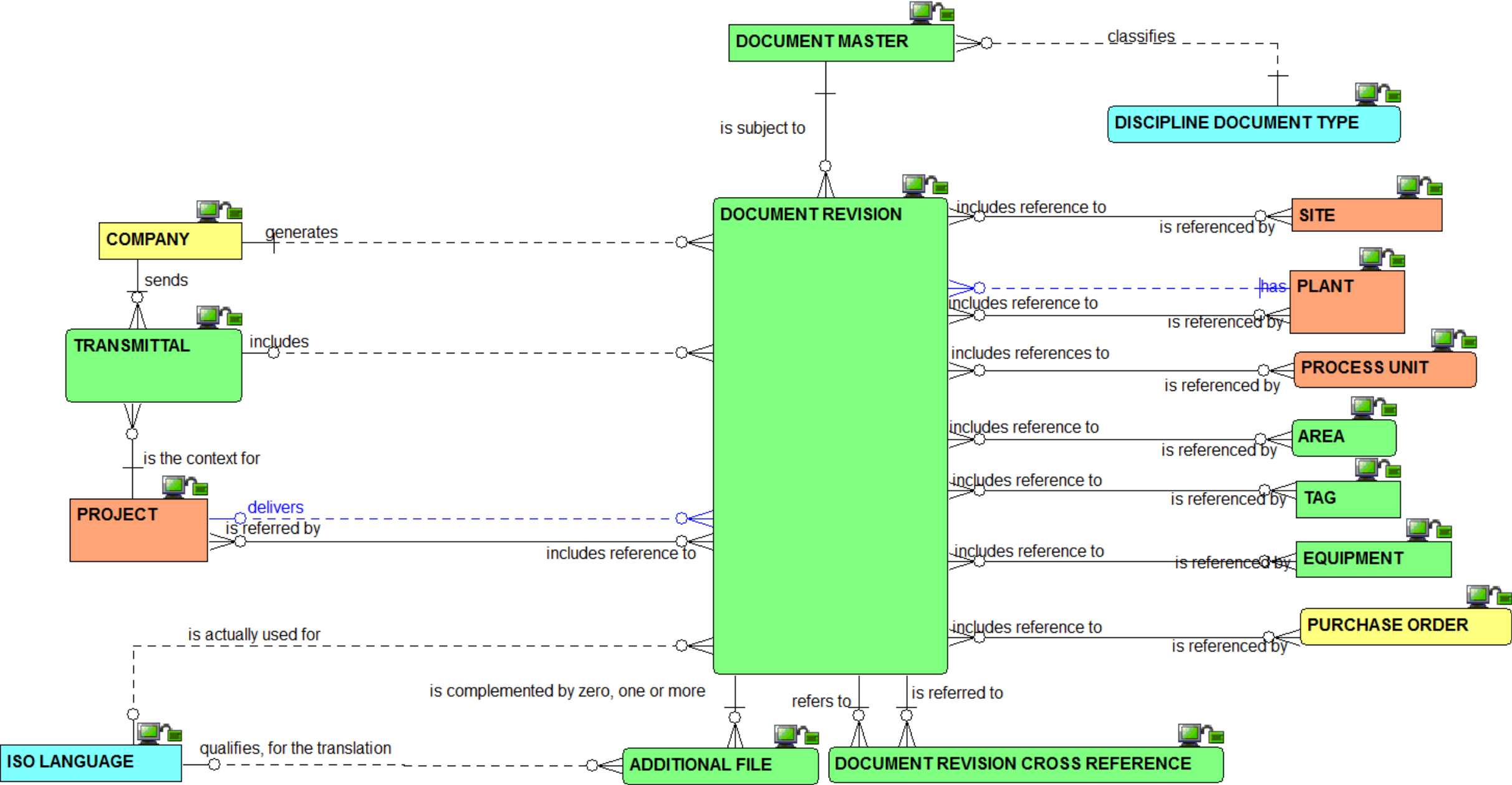
"Forecast" should be understood, for the first submission of the document master, as the base planned date



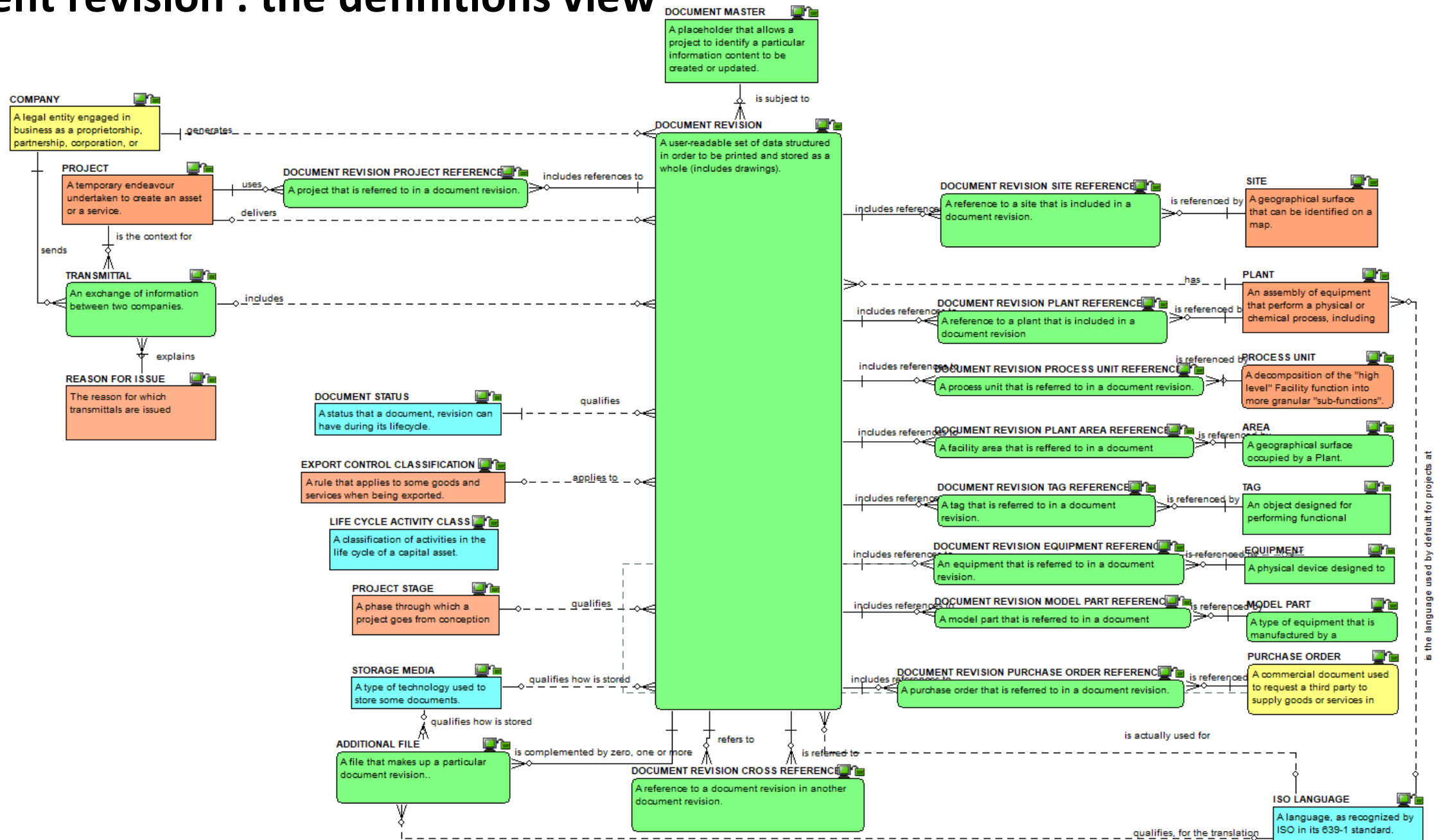
Document revision : the relationships view



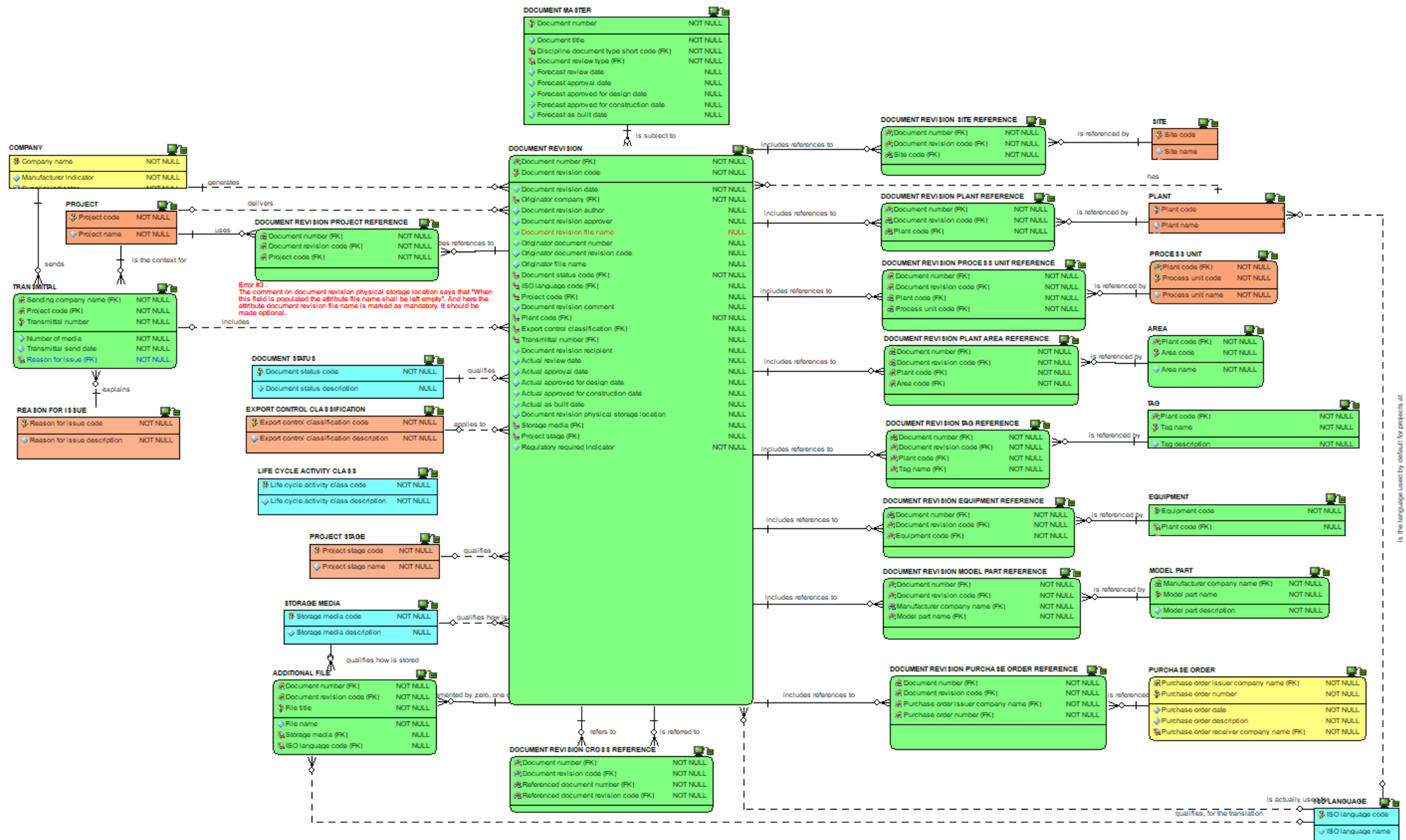
Document revision : the simplified relationships view































Document revision : the definitions view



Document revision : the attributes view

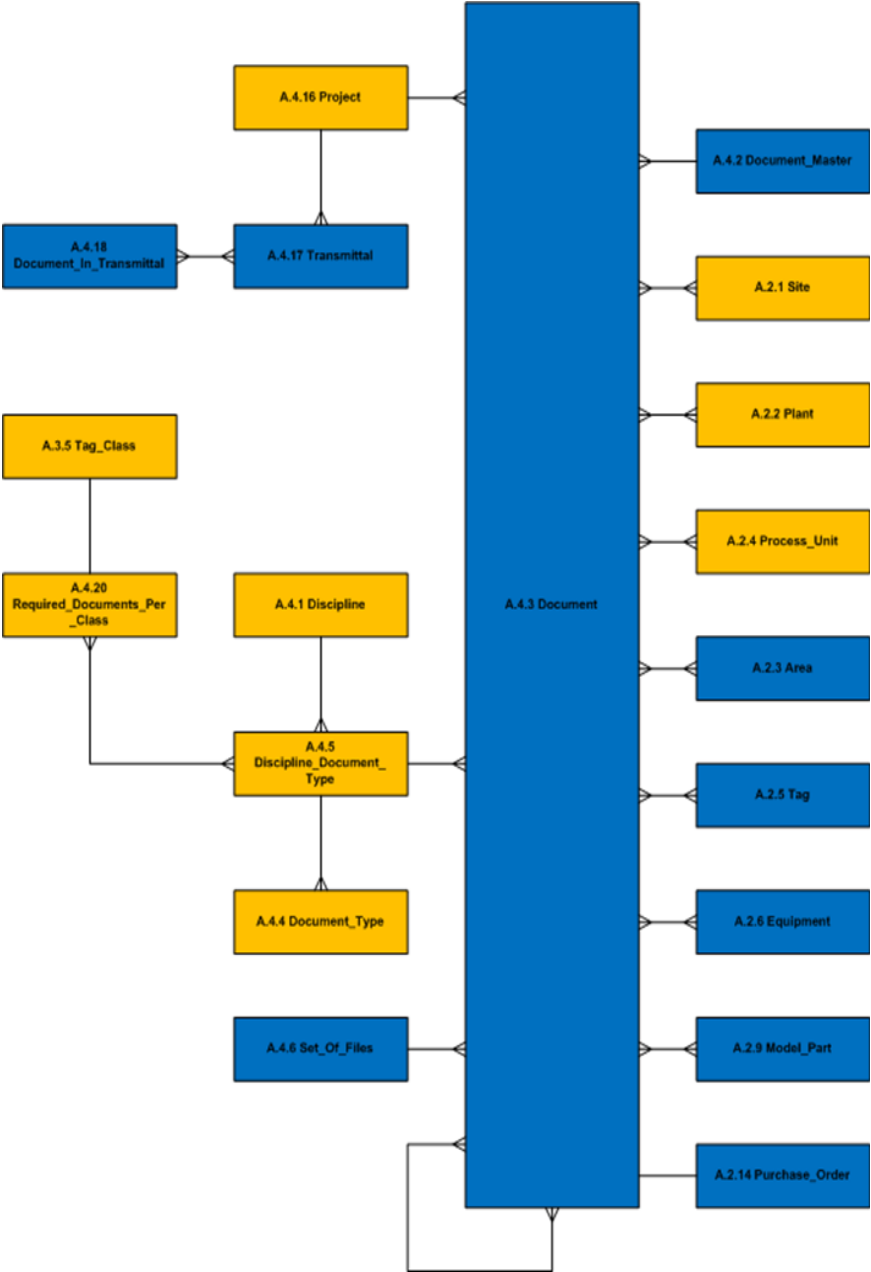


Document revision : zoom on the attributes

DOCUMENT REVISION			
 Document number (FK)	VARCHAR(40)	NOT NULL	
 Document revision code	VARCHAR(5)	NOT NULL	
 Document revision date	DATE	NOT NULL	
 Originator company (FK)	VARCHAR(30)	NOT NULL	
 Document revision author	VARCHAR(70)	NULL	
 Document revision approver	VARCHAR(50)	NULL	
 Document revision file name	VARCHAR(255)	NULL	
 Originator document number	VARCHAR(40)	NULL	
 Originator document revision code	VARCHAR(5)	NULL	
 Originator fille name	VARCHAR(255)	NULL	
 Document status code (FK)	VARCHAR(40)	NOT NULL	
 ISO language code (FK)	VARCHAR(2)	NULL	
 Project code (FK)	VARCHAR(10)	NULL	
 Document revision comment	VARCHAR(255)	NULL	
 Plant code (FK)	VARCHAR(40)	NOT NULL	
 Export control classification (FK)	VARCHAR(40)	NULL	
 Transmittal number (FK)	VARCHAR(100)	NULL	
 Document revision recipient	VARCHAR(70)	NULL	
 Actual review date	DATE	NULL	
 Actual approval date	DATE	NULL	
 Actual approved for design date	DATE	NULL	
 Actual approved for construction date	DATE	NULL	
 Actual as built date	DATE	NULL	
 Document revision physical storage location	VARCHAR(40)	NULL	
 Storage media (FK)	VARCHAR(20)	NULL	
 Project stage (FK)	VARCHAR(40)	NULL	
 Regulatory required indicator	CHAR(1)	NOT NULL	

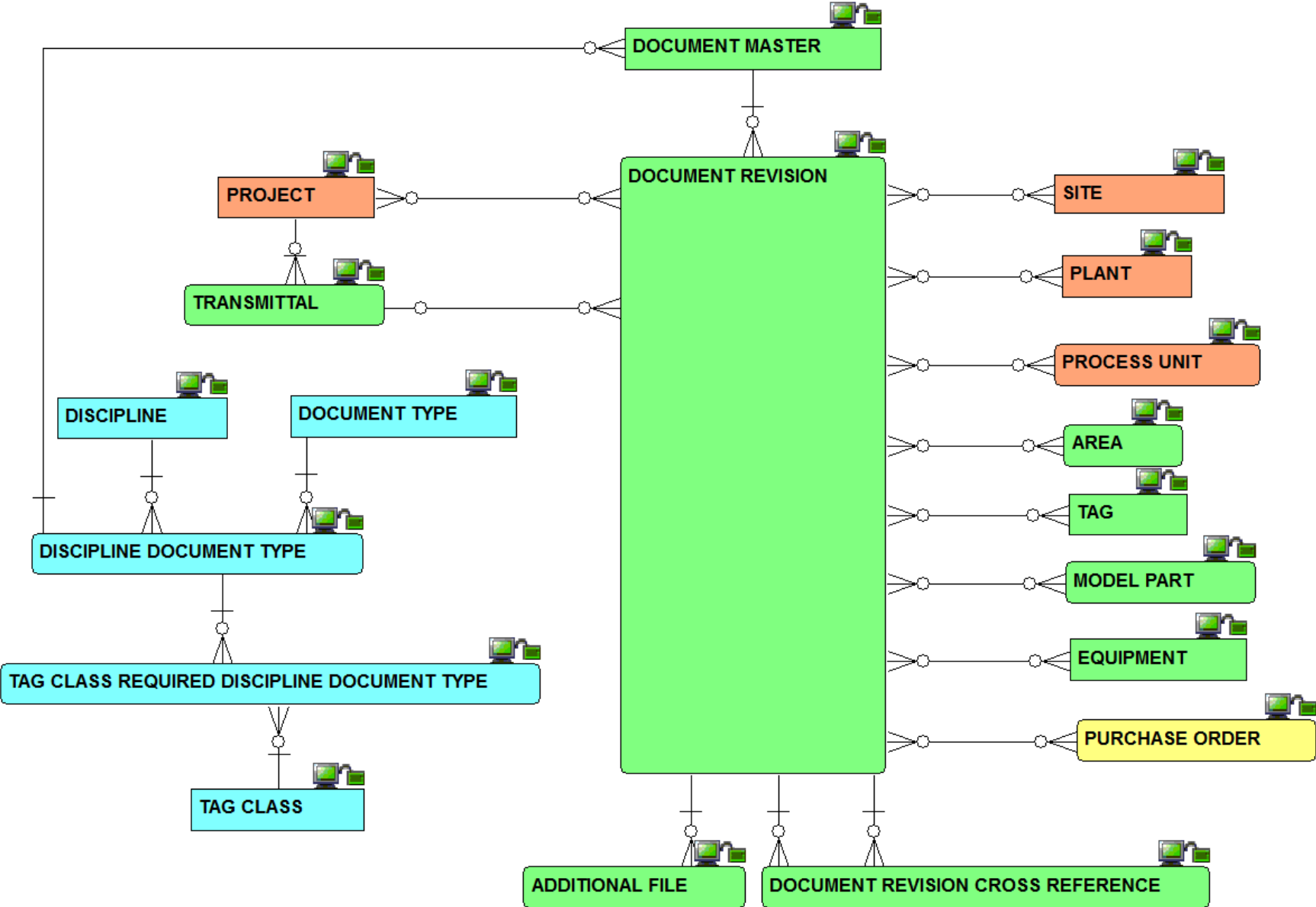
Checkpoint 3 : Summary after review of the third third of the data model

As was



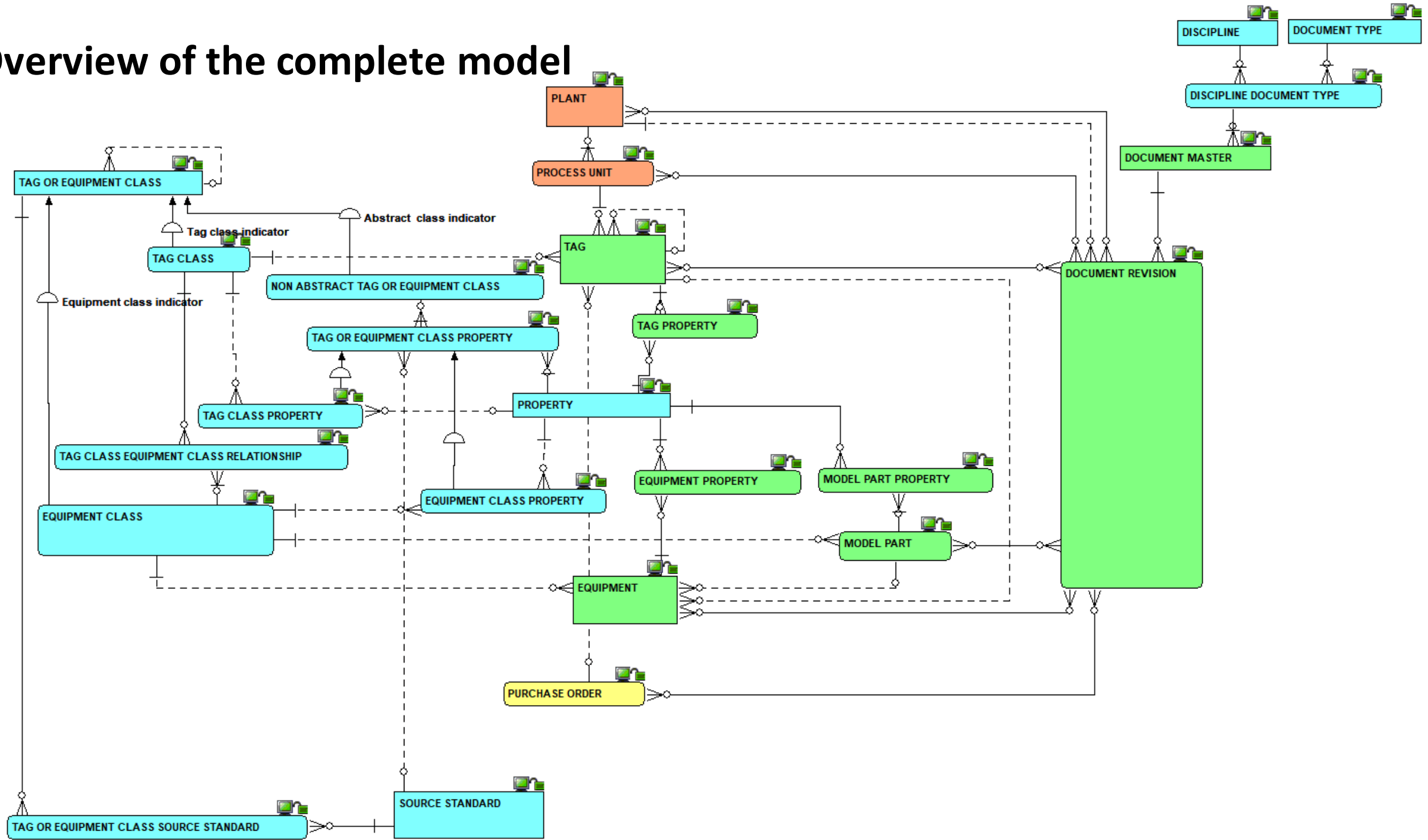
Checkpoint 3 : Summary after review of the third third of the data model

As is

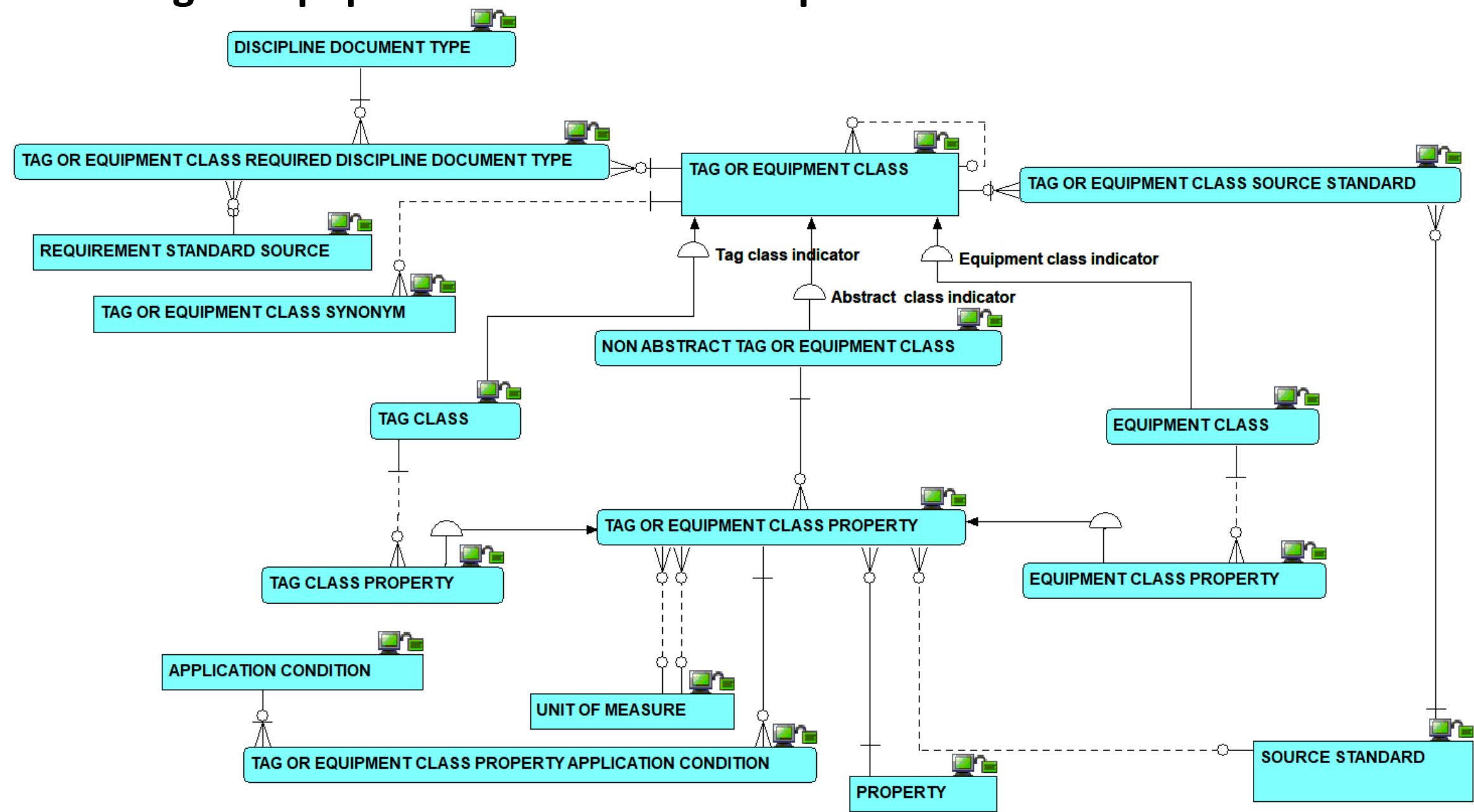


Solid line for identifying relationships, dashed line for non identifying ones

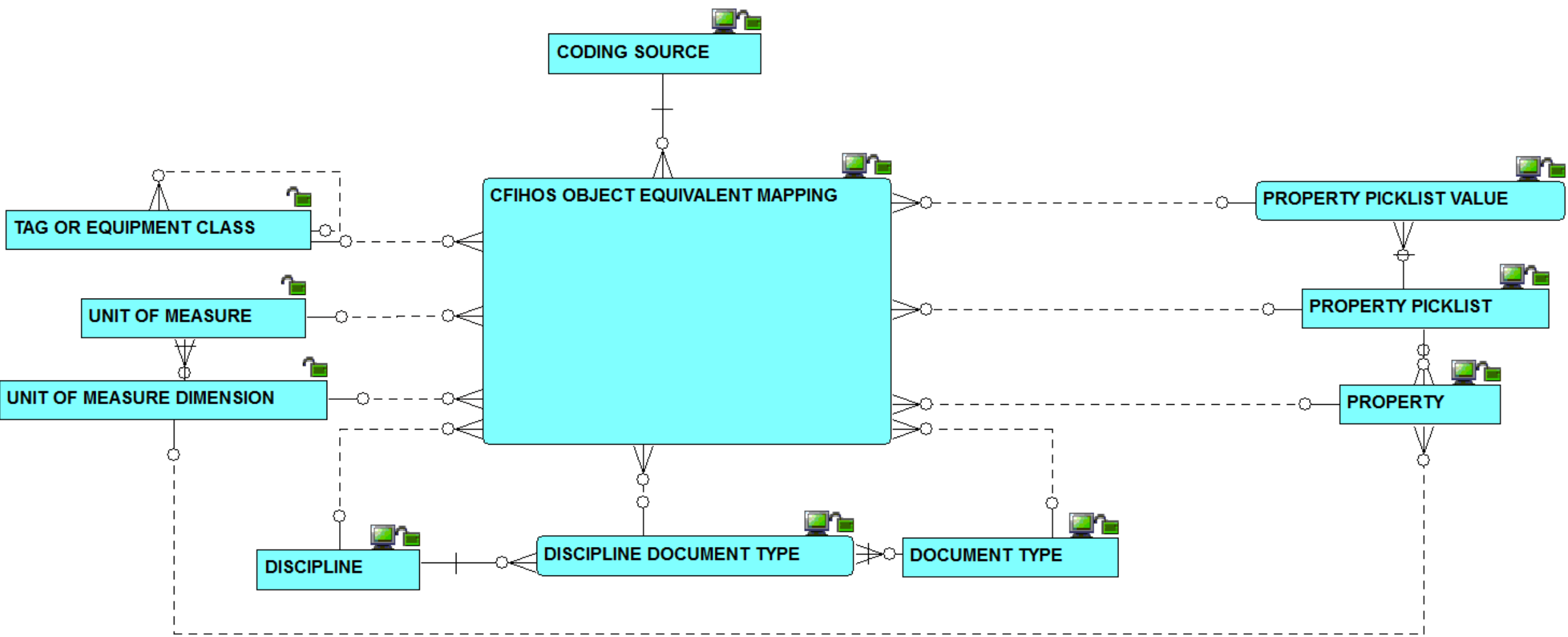
Overview of the complete model



Overview of tag or equipment class relationships

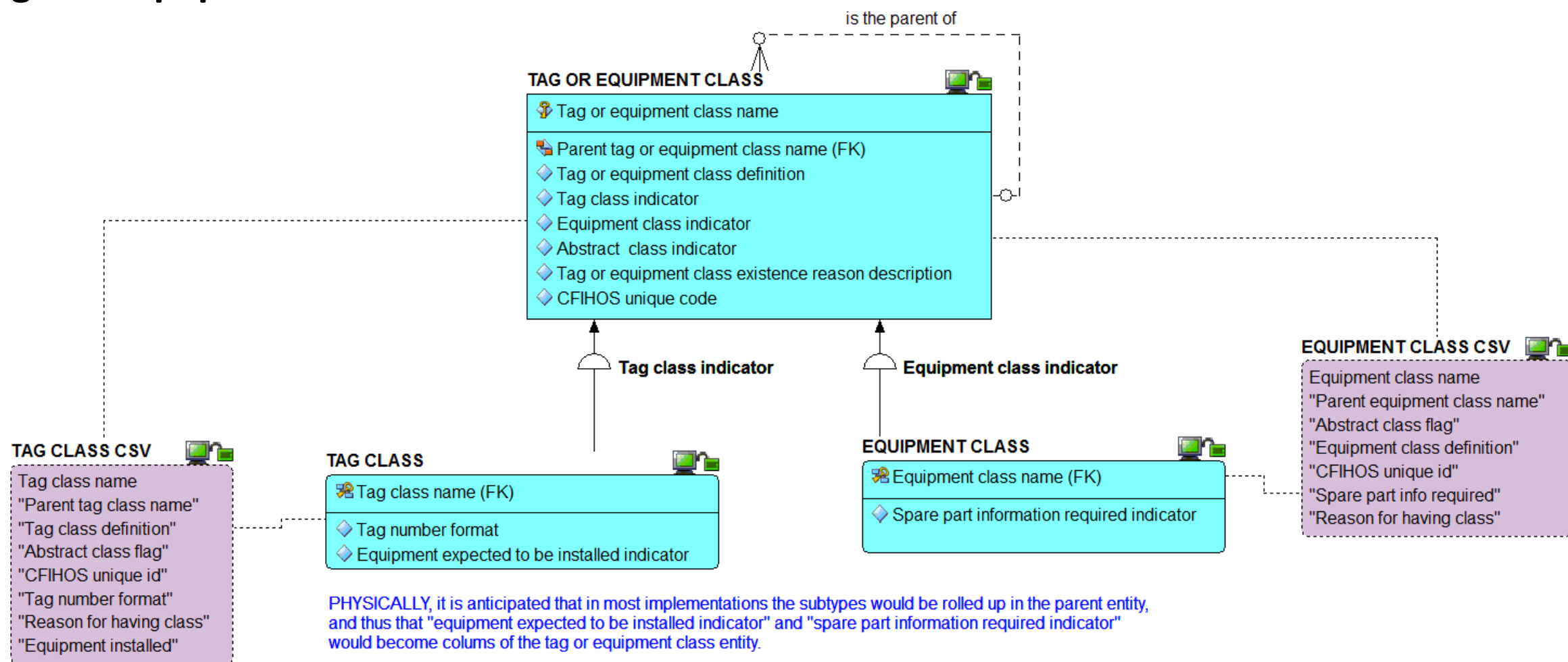


Overview of CFIHOS alternate code mapping capabilities



The relationship between the logical model and the CSV files :

1) tag and equipment class



PHYSICALLY, it is anticipated that in most implementations the subtypes would be rolled up in the parent entity, and thus that "equipment expected to be installed indicator" and "spare part information required indicator" would become columns of the tag or equipment class entity.

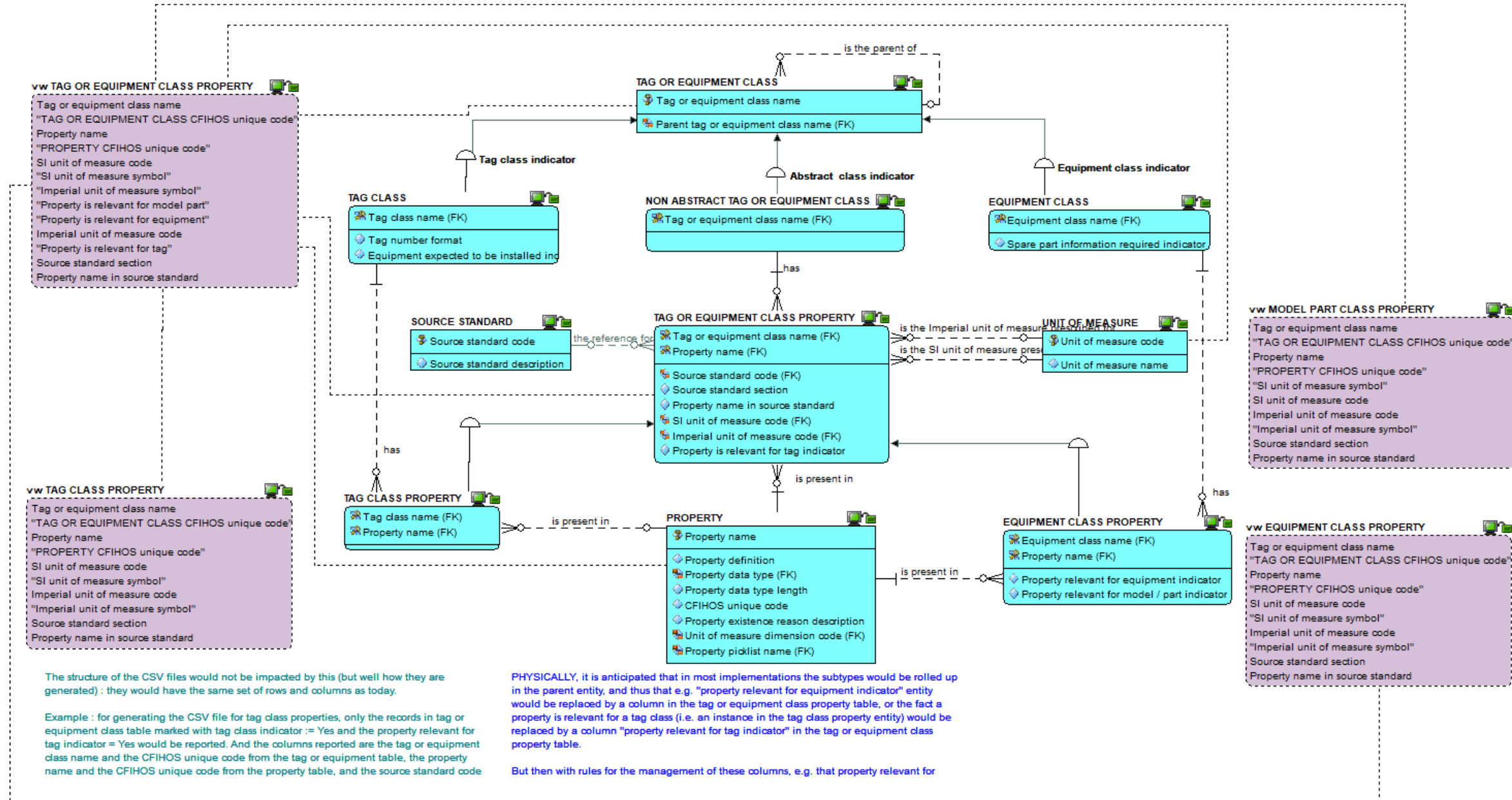
But then with rules for the management of these columns, e.g. that equipment expected to be installed indicator must be filled in when the tag class indicator = Yes, and must not be filled in when the tag class indicator = No.

The structure of the CSV file would not be impacted by this (but well how they are generated) : they would have the same set of rows and columns as today.

Example : for generating the CSV file for tag classes, only the records in tag or equipment class table marked with tag class indicator := Yes would be reported. And the columns reported are the parent tag or equipment class name, the tag or equipment class name, the tag or equipment class definition, the tag or equipment class

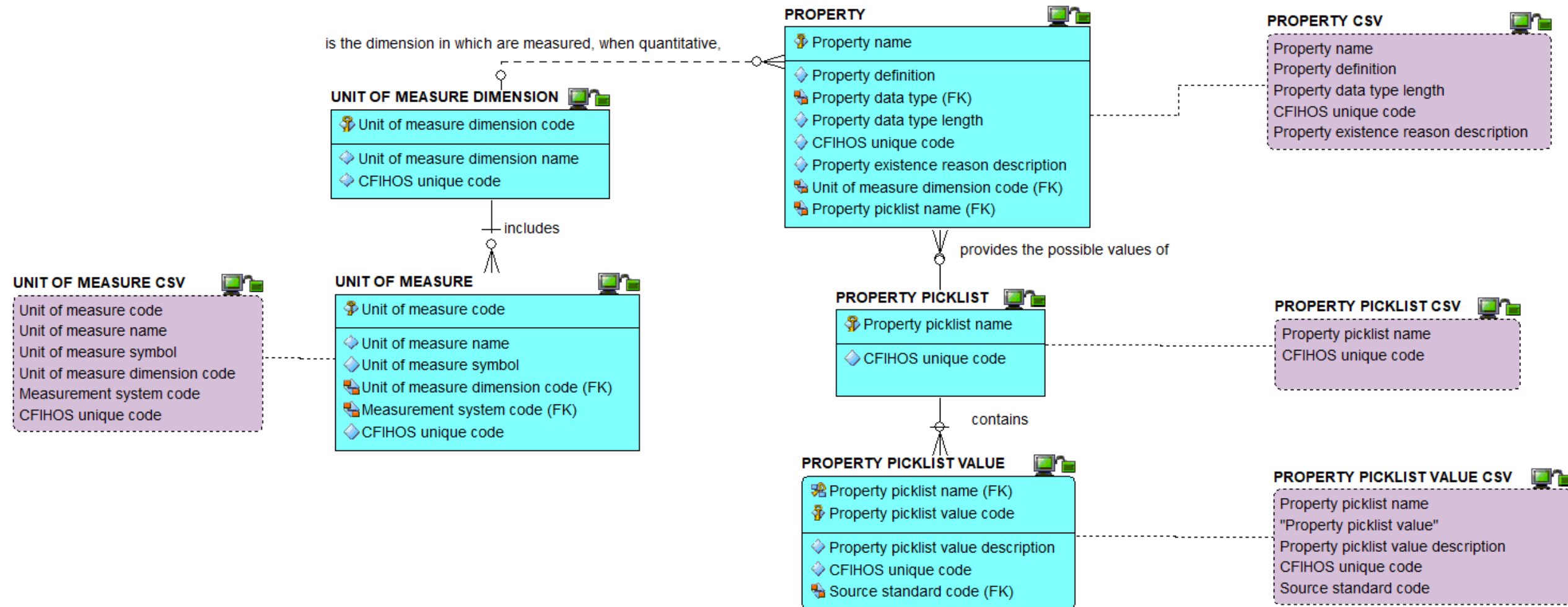
The relationship between the logical model and the CSV files :

2) tag and equipment class property



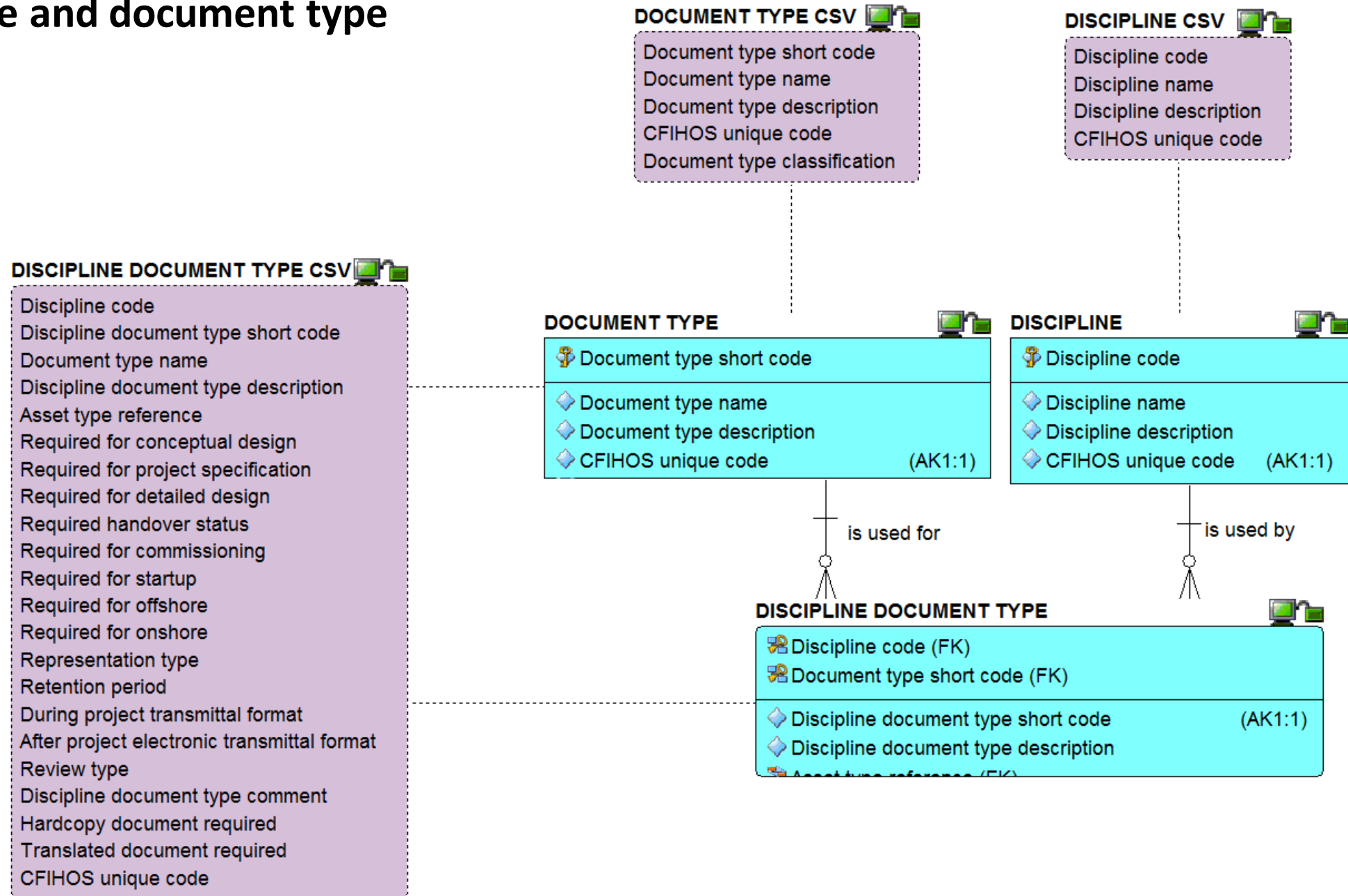
The relationship between the logical model and the CSV files :

3) Property, pick list and unit of measure



The relationship between the logical model and the CSV files :

4) Discipline and document type



The relationship between the logical model and the CSV files :

5) Entities implemented as pick lists in RDL and its link to CSV

