Product Data Exchange

Annex : Reference mechanism

Version 1

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1. Approach of the Reference Mechanism

A mechanism is a means to minimally identify a portion of product data that is not required or not feasible to be completely exchanged, but has to be uniquely identified to support the incremental data exchange and a complete relevant view on a certain portion of product data. A referenced entity is explicitly classified as a reference to provide the capability to be processed by STEP processors in future.

In generally there is no mandatory need to instantiate a reference, so the reference mechanism is not bondage for a sending system. However if a sender uses the reference mechanism the receiver has to be capable to process and to interpret the related objects.

In a certain communications both partners have to agree upon weather the reference mechanism should be used / supported or not.

2. Motivation

The motivation for the reference mechanism is to :

- effectively reduce of the amount of data within an data exchange package,

- provide a complete view on product data even if some detailed information is not intended to be exchanged at a certain time.

3. Examples

3.1. Example 1 (trans-module reference)

If an assembly with four components has to be re-designed and communicated but one component has not been changed at all, this component may be referenced by its unique identifier. This component must not be omitted, since it may be interpreted as removed if it is neither exchanged nor referenced.

3.2. Example 2 (inter-module reference)

If a document contains a CAD model and the CAD model has been renamed or has been converted into another format then this changes have no effects on the related item. To communicate this change at least the process modules Changes in Shape Definition and Transformations (PM-SDT) and Changes in Document and File Management Data (PM-DFM) are needed but the Process Module Changes in Item Identification, Classification and Properties (PM-ICP) is not needed, because related information has not been changed. Nevertheless, if a certain business process requires specifying the item to which the concerned document is related then some entities of the data module DM-ICP have to be transferred, but not the complete DM-ICP. This can be realized by means of a reference if the concerned item is classified as a reference.

3.3. Example 3 (reference to objects out of scope)

If a development partner sends a certain portion of product data to another partner but this portion of product data is only a subset of an assembly's set of components that the partner is allowed to know in detail, then the covered components should at least be referenced and send back including these references. This provides a complete view on the product structure (see Example 1 in Annex - Template for company specific guideline).

4. Rules associated to the reference mechanism

- A sender has to provide a minimum of entities, attributes and attribute values, which are necessary to uniquely identify the referenced object. Otherwise a receiver will interpret the same object as a new one because of different identifiers.
- Other data associated to the referenced instance or group of instances shall not be instantiated.
- A reference is applicable to an existing object at sender's and/or receiver's site or represents an object as a 'placeholder', i.e., an instance may be referenced at a certain time of data exchange if it was exchanged before or if it will be exchanged later on.
- A reference is explicitly classified by a *general_classification* (see instantiation diagram below).

5. Instantiation

Product data capable for the reference mechanism are items, documents and external files. In addition to the entities and attributes required to implement the reference flag some more entities are required to support the unique identification of referenced objects.

- **Items :** The entity, which is classified as a reference, is the *design_discipline_item_definition.* The unique identification of an item requires the entities *design_discipline_item_definition*, *item_version*, *item, specific_item_classification* and *application_context* with their mandatory attributes. Additionally the entities *person_organization_assignment* and *organization* with their mandatory attributes are required to support the specification of an id owner.
- **Documents :** The entity, which is classified as a reference, is the *digital_document.* The unique identification of a document requires the entities *digital_document*, *document_version* and *document* with their mandatory attributes. Additionally the entities *person_organization_assignment* and *organization* with their mandatory attributes are required to support the specification of an id owner.
- **External Files :** the entity, which is classified as a reference, is the *digital_file.* The unique identification of an external file requires the entities digital_file, *external_file_id_and_location* and *document_location_property* with their mandatory attributes.
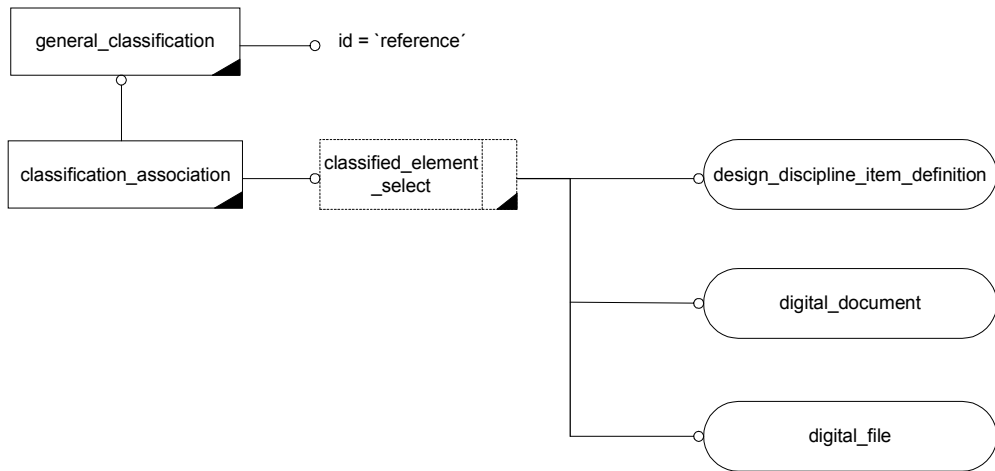
Figure 1 - Instantiation of a reference classification