

AFNeT – prostep ivip STEP AP242 Day

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Airbus, Toulouse

Next opportunities for deployment
of STEP AP242 capabilities:

Jean-Yves DELAUNAY, Airbus



Table

- Opportunities to launch the R,V&V Management Implementer Forum as part of the actions to support MBSE interoperability
- Opportunities to exchange 3D instruction models between Manufacturing – Engineering Prep. systems and Manufacturing Execution Systems
- Opportunity to define generic process and use cases for exchange of “As Design” and “As Built” product structure

Use case for exchange of Requirement information set for traceability

<http://www.asd-ssg.org/systems-modelling-interoperability>



AeroSpace and Defence Industries Association of Europe
Requirement Management Interoperability




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Requirement Management Interoperability

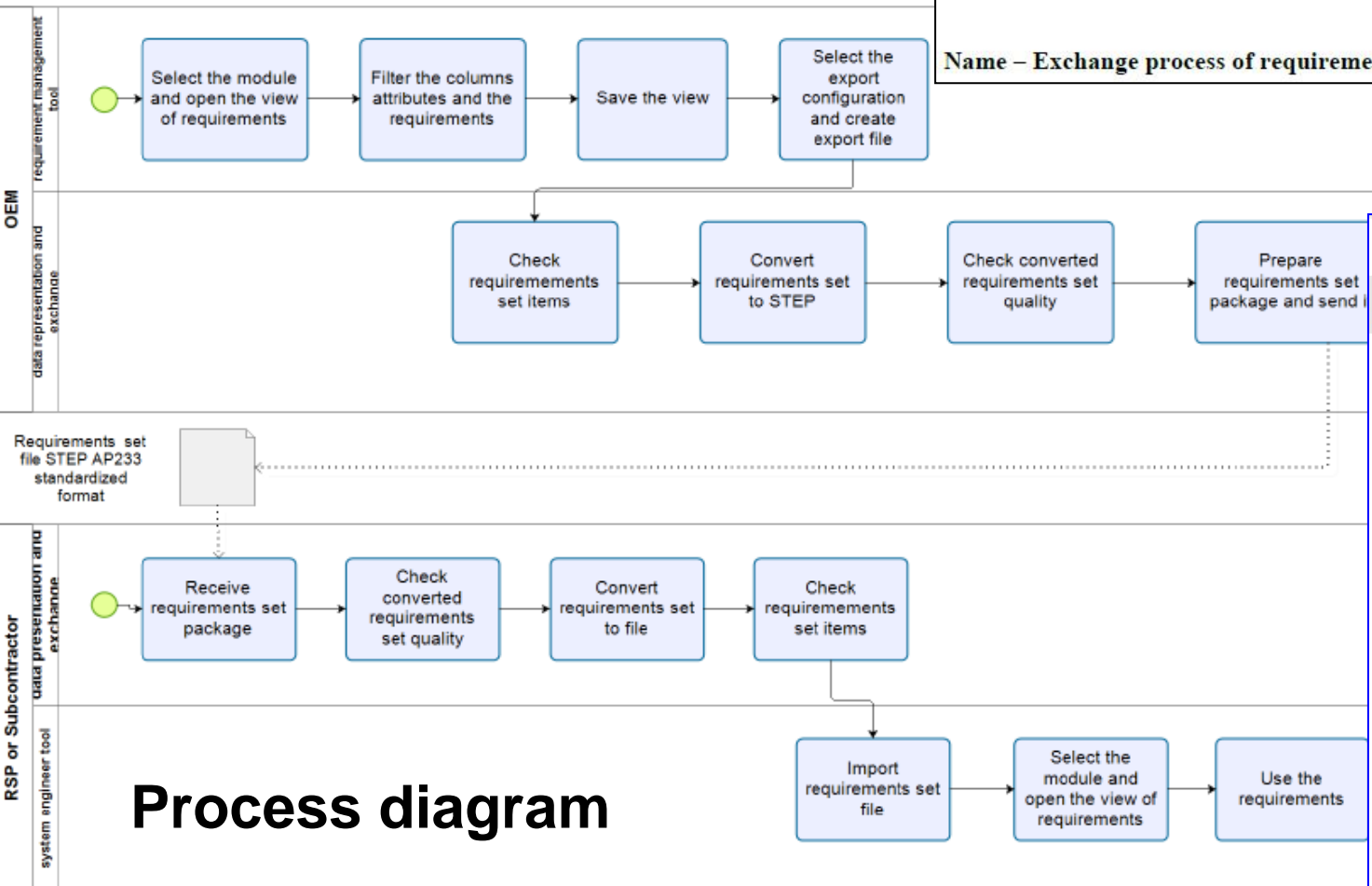
Description of scenario

Name - Exchange process of requirements set between OEM and RSP.

Problems and needs:
The exchange and use of requirements between people within the same enterprise or in the frame of extended enterprises is quite complex because information to export could be numerous and various.
For example, requirements are generally stored in different Requirements Management tools. Each tool presents the requirements list in a table containing a set of requirements (Name) and additional information (chapter, explanation, etc.). The requirements' status are often defined through different columns (e.g. Requirement Status, reviewed, obsolete, etc.). If some European Aerospace and Defence industries use IBM DOORS® for managing requirements, other tools or databases (like Windward, Excel, Access, etc.) could be used as well.
Data representation and exchange of requirements are not well standardized even if some data models start to be properly defined. This situation drives difficulties to assure smooth exchange of information between different tools. She requires the development of adapters for receiving and using the right data. Moreover, if attributes are clearly defined for requirements, they remain coded as raw text. This is the case for requirement statements focusing on the expected behaviour or on the global performance of product. Therefore, to exchange a specific set of requirements' attributes from one to several stakeholders, several means supporting a standardized export of data and processes between different tools are required.
The lack of tool interoperability for the exchange and management of requirements still exists and justifies we address this issue. In this business case, the specific attributes of a set of requirements are extracted from a requirement management tool in order to be exchanged from a main actor (the Original Equipment Manufacturer - OEM) to a second actor (the risk sharing partner - RSP). The OEM sends its set of requirements to the RSP. The first one should reply with information regarding the interpretation and use of requirements. The OEM then will manage his requirements with regard to the answers given by the RSP.
Context of use case (global overview)
A company (customer - OEM) wants to share a Requirements Set with one or more other companies (supplier or RSP) and to get back answers from them in his RM tool Database.
Note: this present use case partially covers the global overview of the context of exchange of information between OEM and RSP.

Description of scenario

Name - Exchange process of requirements set between OEM and RSP.



Process diagram



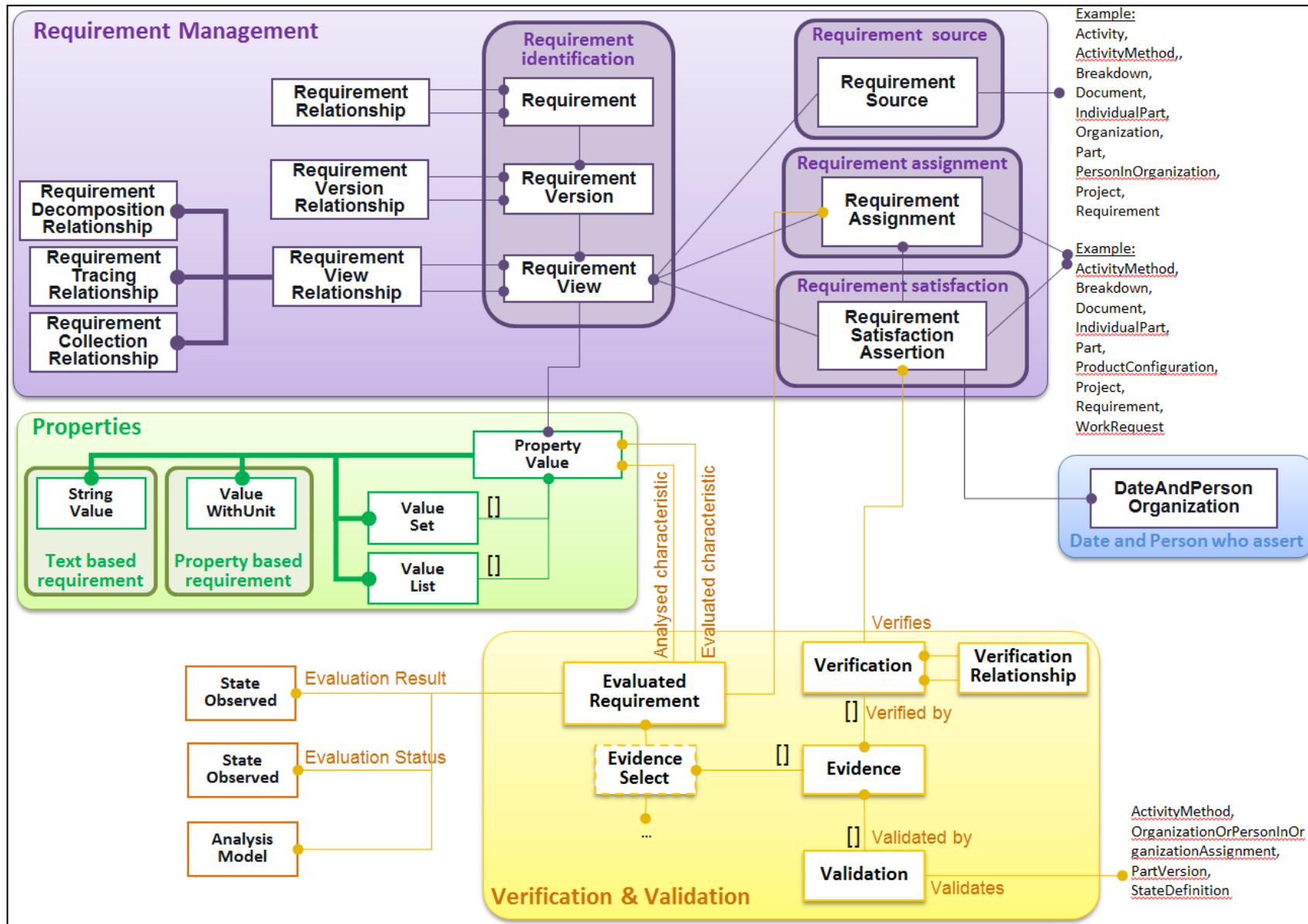
Types of information to be exchanged in the Requirement Mangt. AP242 XML public test case



Examples of information coming from the level 1 requirements file:

- **Identifier:** Unique identifier for the object filled automatically by DOORS RMF
- **Requirement Version:** Version number of the requirement that enables to manage requirements into configuration.
- **Requirement Statement:** States an expected behaviour or global performance of the product under consideration.
- **Working Status:** Current version of the requirement/activity.
- **Rationale:** Provides the justification and/or the reason for the activity/requirement. The rationale is particularly useful for orphan requirement (i.e. requirement that are not traced to an upper level requirement).

Opportunities to launch the R,V&V Management Implementer Forum as part of the actions to support MBSE interoperability

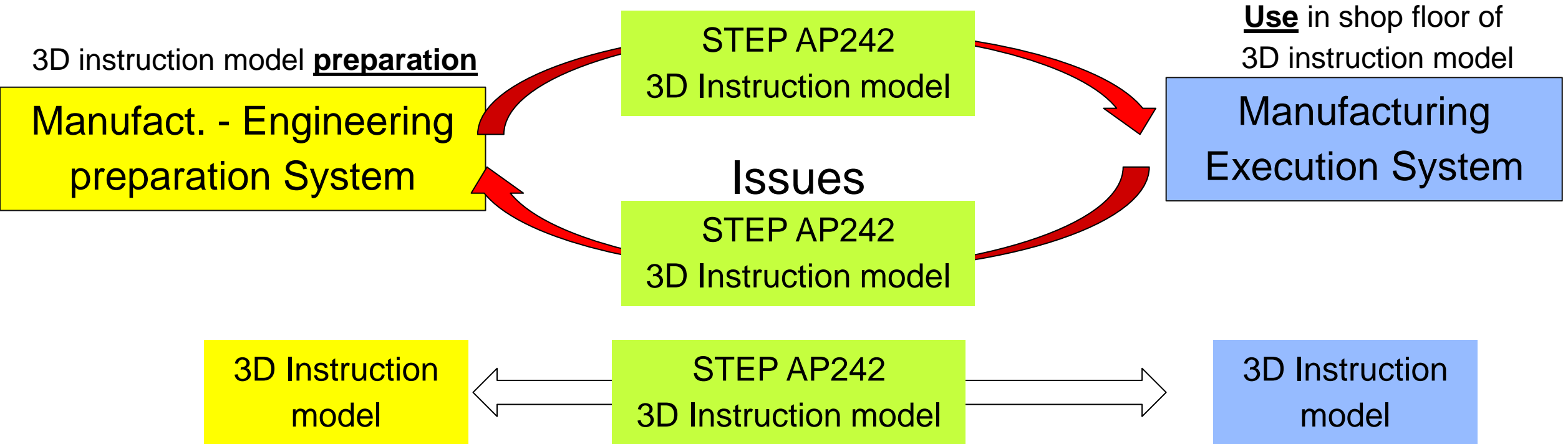


Overview of AP242 ed2 domain model for Requirement, Validation and Verification Management

Information model shared with

- AP233 ed1 “Systems Engineering”
- AP239 ed3 “Product Life Cycle Support”
- AP243 “MoSSEC”

Opportunities for exchange of 3D model working instructions between Manuf. – Engineering. preparation system and Manuf. Execution System

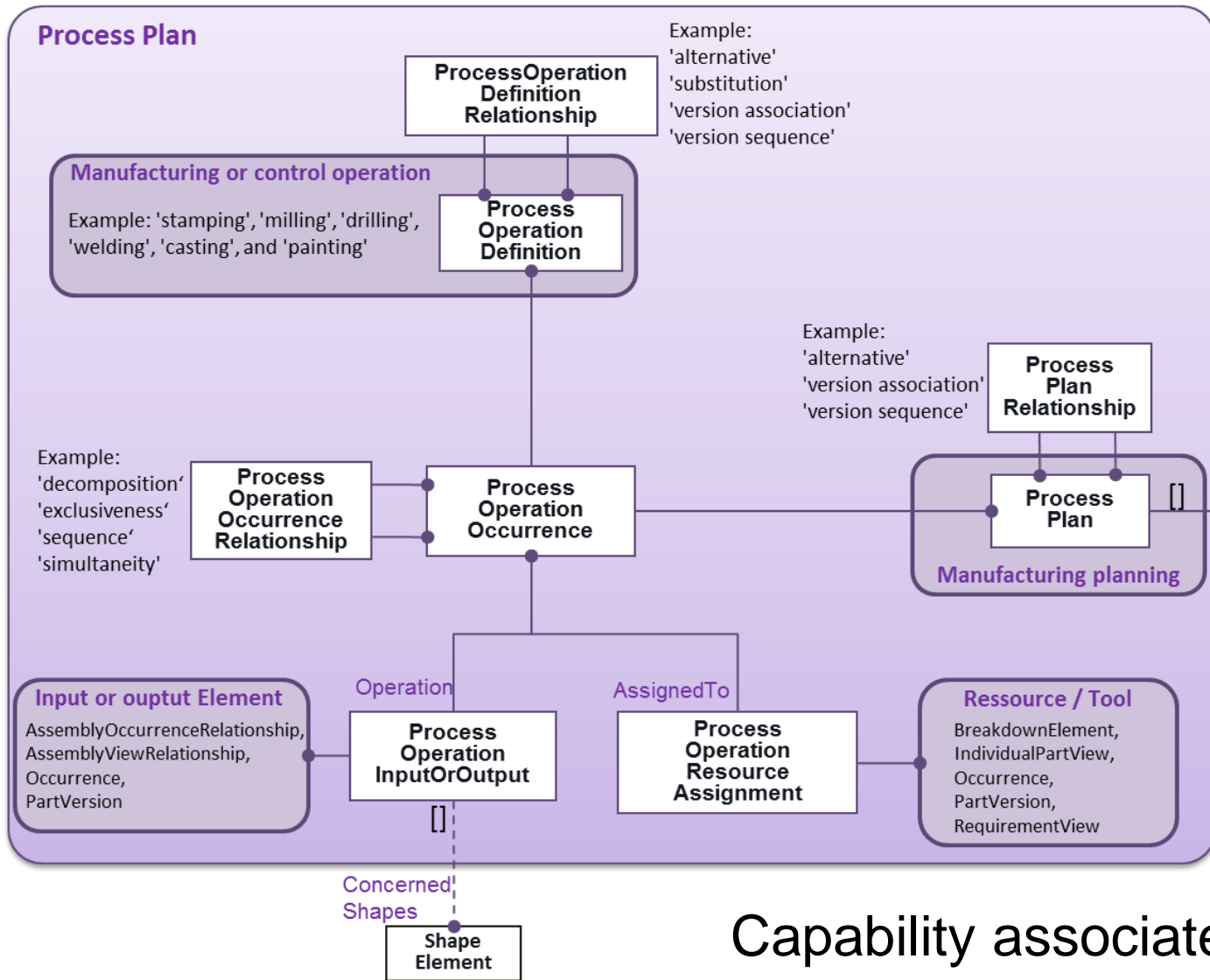


Simplified high level information model

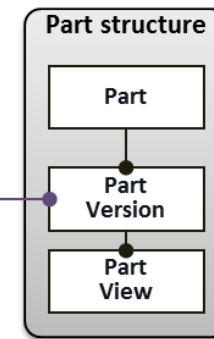
product assembly and Gig & Tools assembly	EXPORT
Meta data of the process plan	IMPORT
Enrichment of specific information for the 3D instruction Model	

EXPORT	product assembly and Gig & Tools assembly
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Opportunities to exchange 3D instruction models between Manufacturing – Engineering Prep. systems and Manufacturing Execution Systems



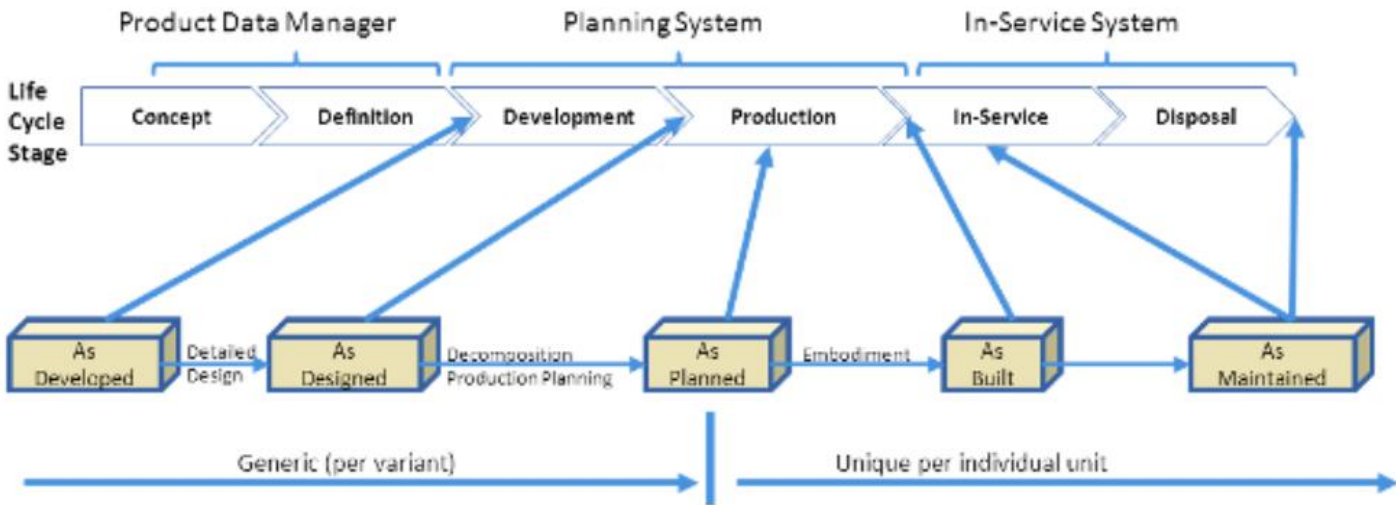
Simplified information model
Of AP242 BO model
for process plan
(illustration from AP242 ed2 DIS-2)



Capability associated with
3D Exact geometry with PMI

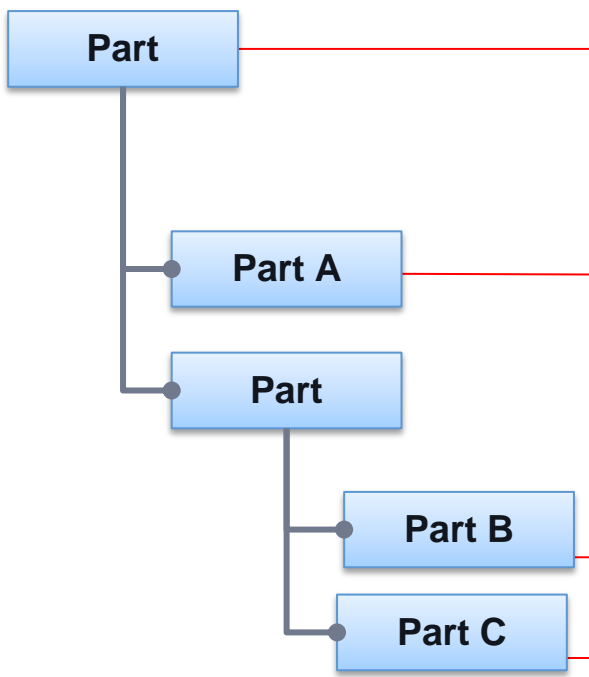
The list of objects affected by the operation occurrence

Preparation of exchange of “As Designed” and “As built” product structure

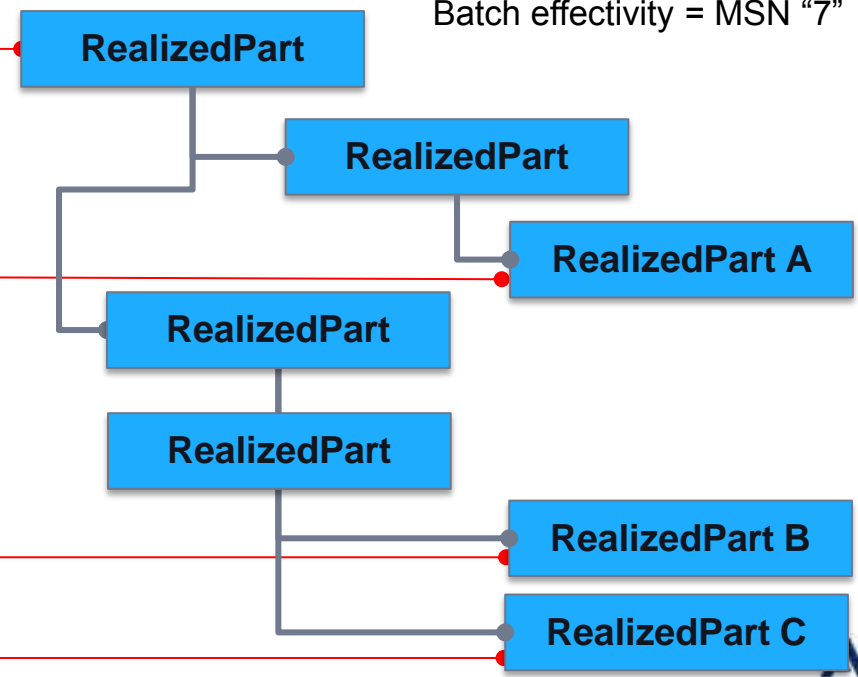


Representation of the individual instances

« As designed » Product Structure

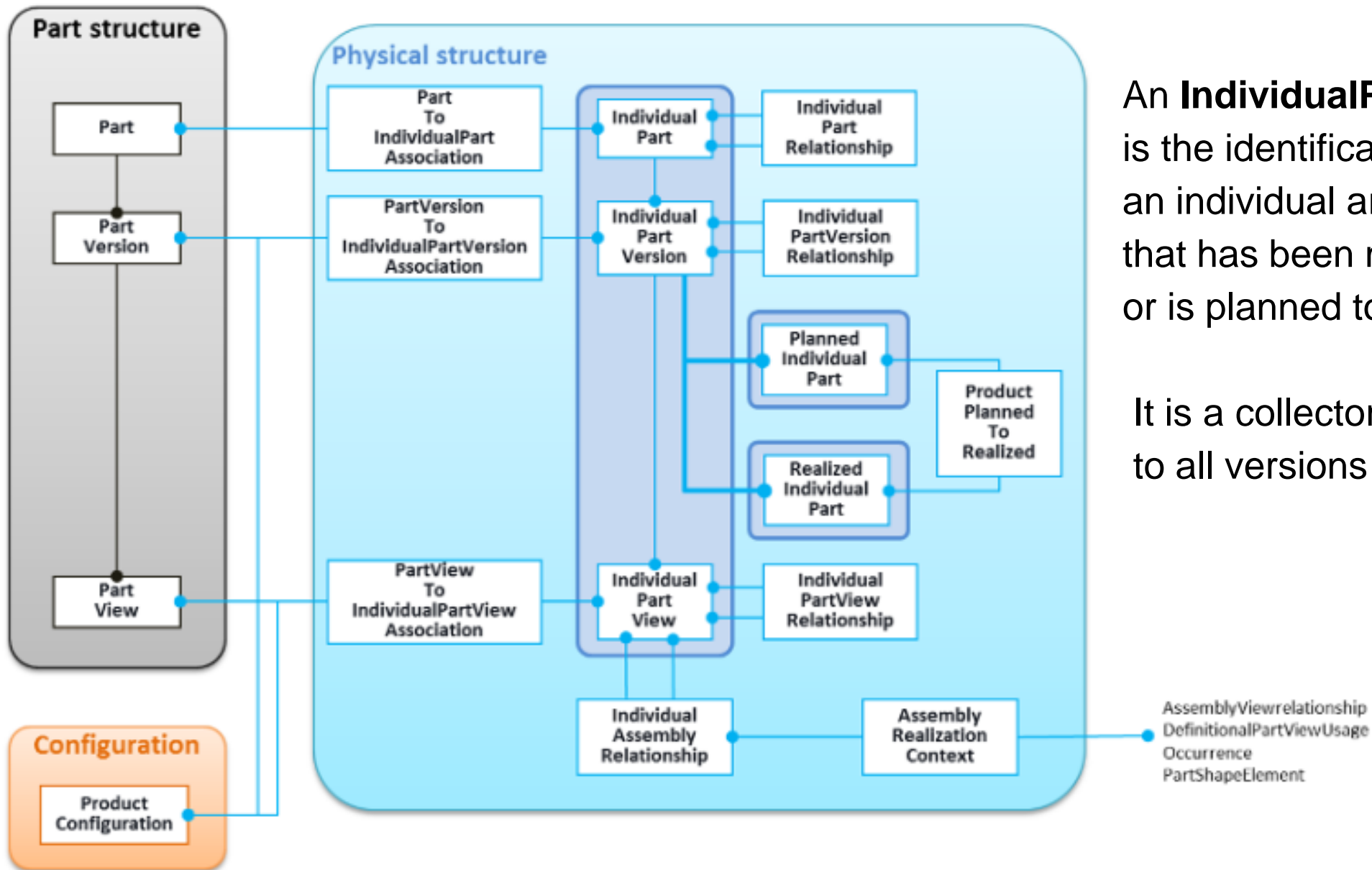


« As built » Product Structure



AP242 ed2 Domain model overview

(Similar to AP242 ed1 BO model)

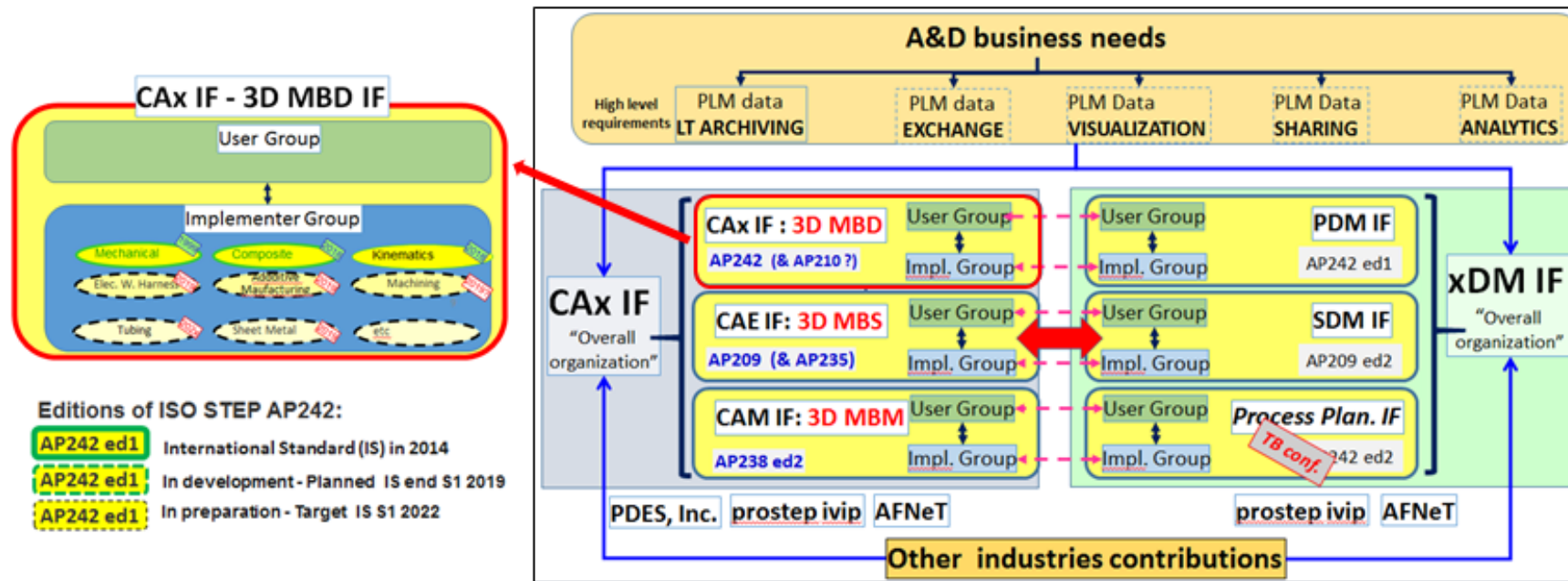


An **IndividualPart** is the identification of an individual artefact that has been made or is planned to be made.

It is a collector of data common to all versions of the **IndividualPart**

Summary

- For some functionalities, the AP242 standard is available, but not implemented in COTS
- Needs for the European Industries to work together
 - to define - agree on common use cases
 - To agree on priorities on use cases to be implemented and tested by the CAx and PDM Implementer Forums



Thank you