



# Visualization framework based on ISO 10303 – STEP standards

*linking product definition, management  
and visualization in the value chain*

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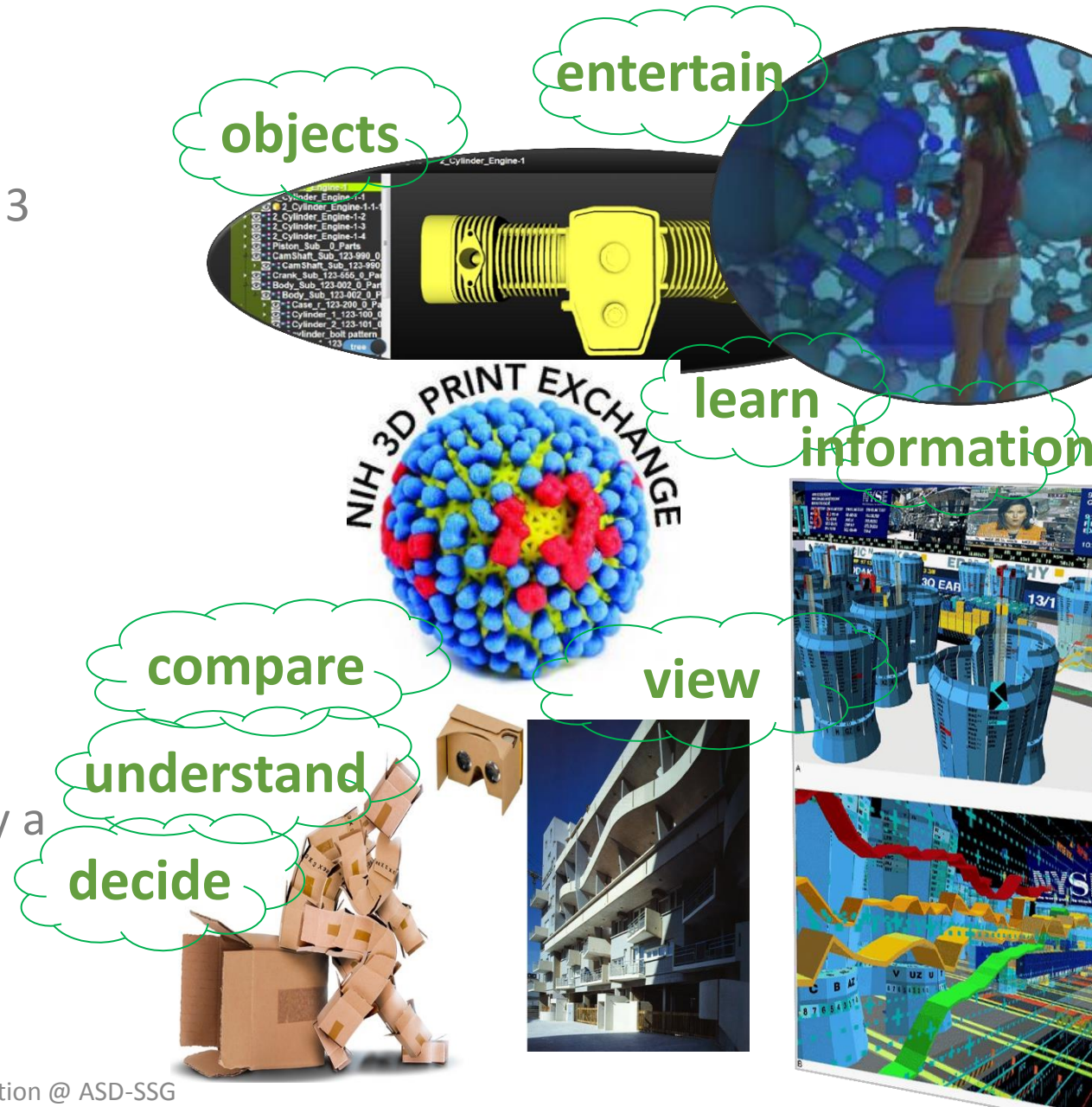
Project leader ISO 14306 ed2



# Would we dare to define 3D visualization ?

3D visualization as the visual presentation on a screen or **another media** of graphical and textual 3 dimensional representations of a **set of data** representing **objects**, **information** or **results** of a computational process in order to:

- facilitate capture of the **understanding** of the **object**, for **visual information sharing with users**
- and sometimes to promote **decision** process by a **human** looking at the data visualized in a medium



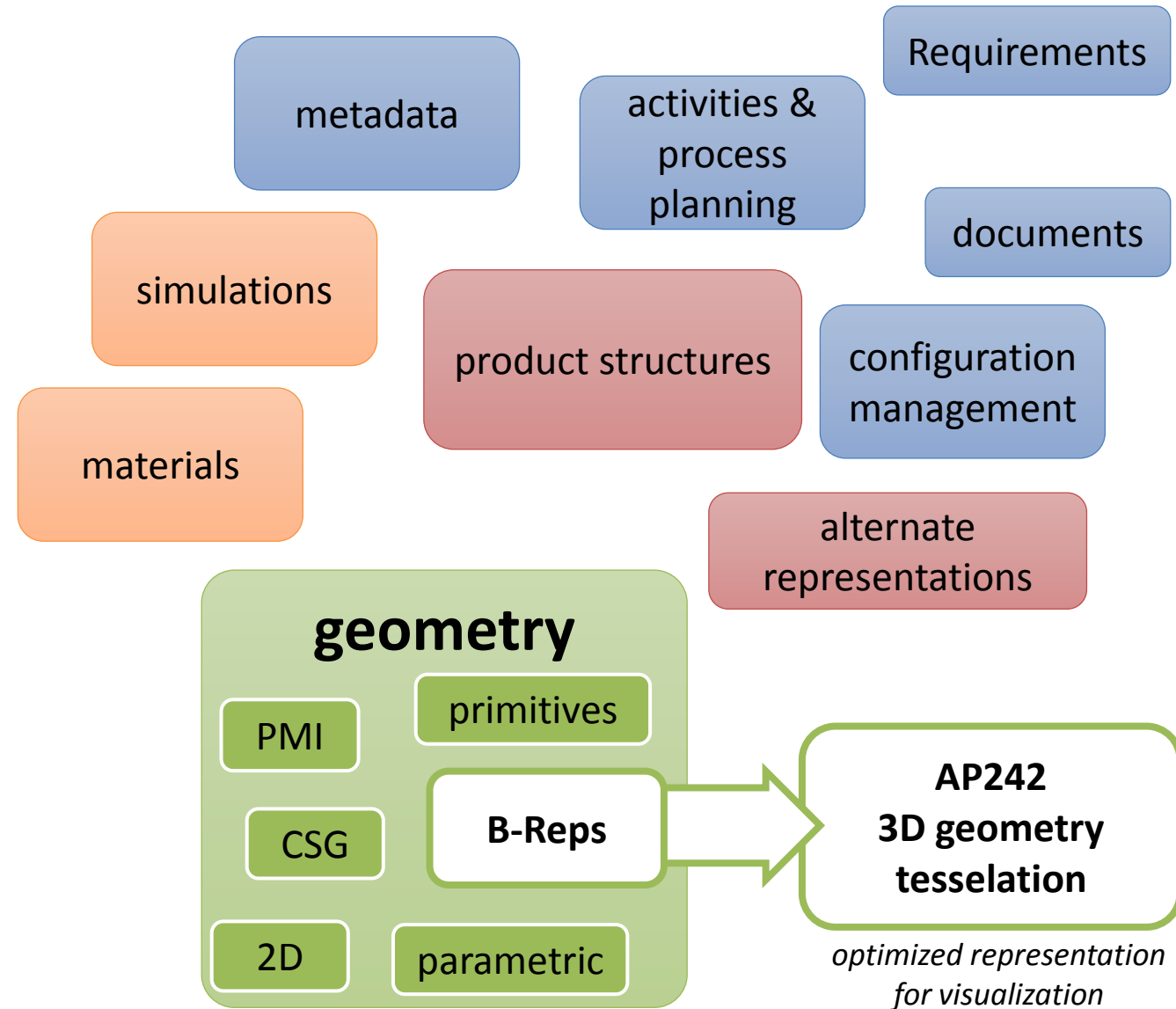


# Visualization in the STEP Framework

STEP provides a data model which integrates the whole data landscape for the product development, manufacturing operations and maintenance.

The concept of multiple representations of the product, including **multiple geometrical representations** allows us to define an **optimized visualization model** with **links** to the rest of the data model.

The model based STEP framework allow us to ensure **consistency** of the integrated **information model** and the corresponding **implementation forms**.





# STEP in a Product Data visualization framework?

## Use Cases

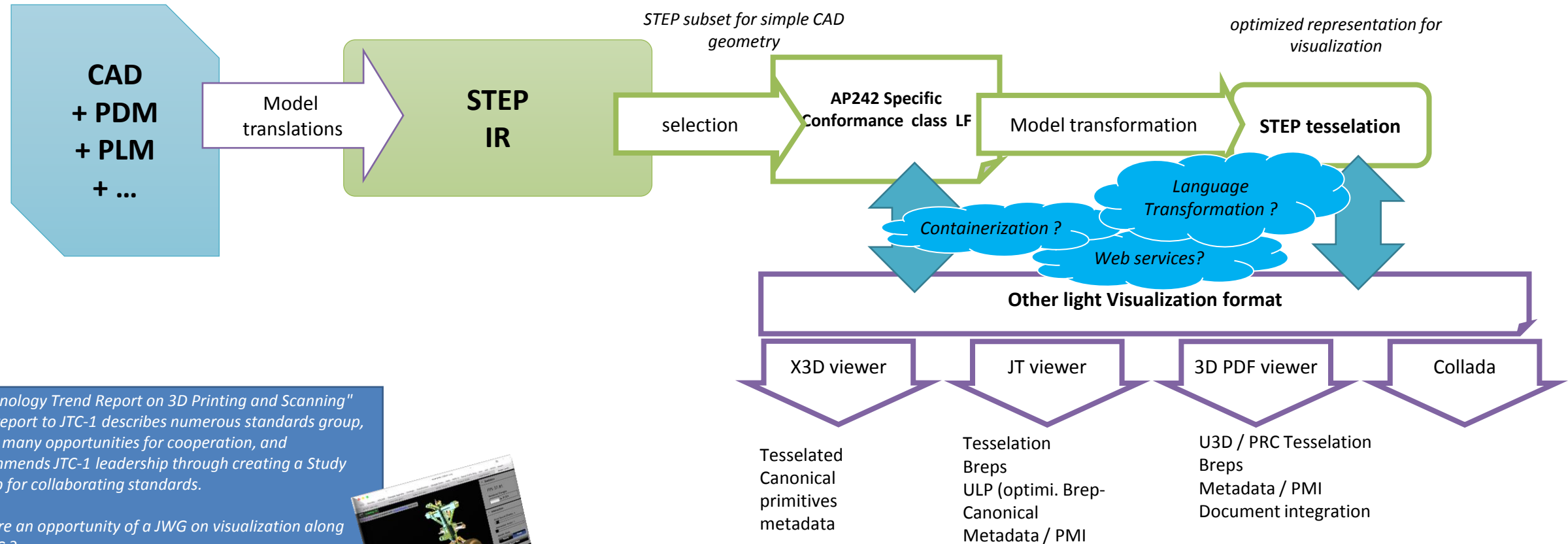
marketing

3D Scanning  
With links to  
Product data

Product data  
navigation

3D Printing  
for training

Virtual & augmented  
reality for  
Maintenance



"Technology Trend Report on 3D Printing and Scanning" JAG report to JTC-1 describes numerous standards group, notes many opportunities for cooperation, and recommends JTC-1 leadership through creating a Study Group for collaborating standards.

Is there an opportunity of a JWG on visualization along ISO TC ?





# Objectives & Next steps

## Objective

- Publish a reference architecture for product data visualization

## Next steps

- Consolidate experience from SC4 report on visualization with latest developments and proposals in this presentation, through an ISO Working Group
- Share and publish visualization use cases
- Confirm and enact efficient liaisons with
  - X3D (Prof; Han, Ch. Mouton (EDF), J. Brangé (SC4))
  - PDF 3D (Boeing)
  - Collada
- Launch ISO 14306 ed3 NWI and work
- Develop STEP optimized information models and interfaces for specialized visualization formats
- Develop reference test cases and data sets
- Promote interoperability testing



# Context and backup information



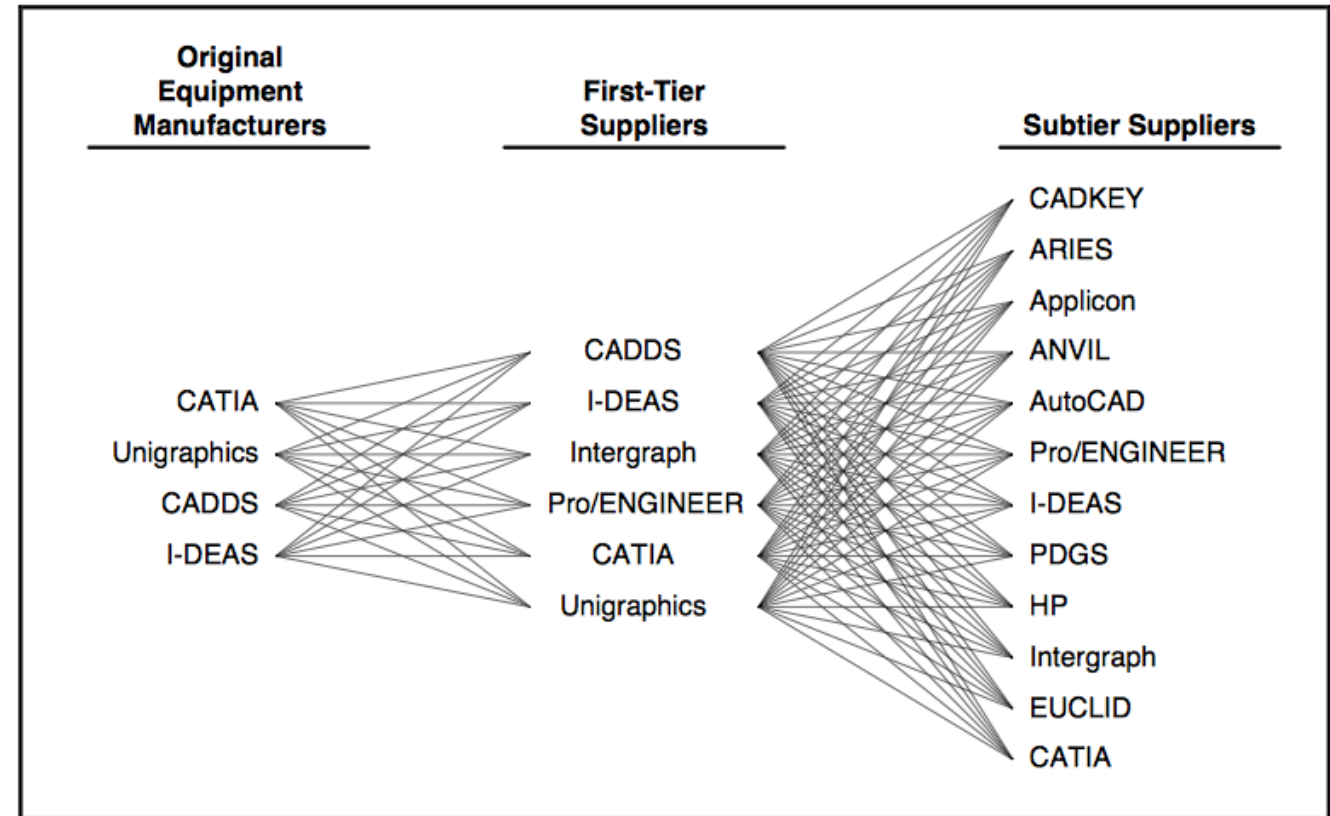


# STEP had Product Data Exchange in its genes

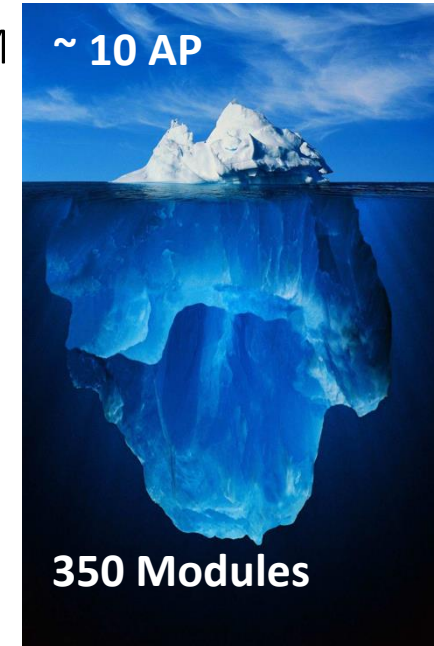
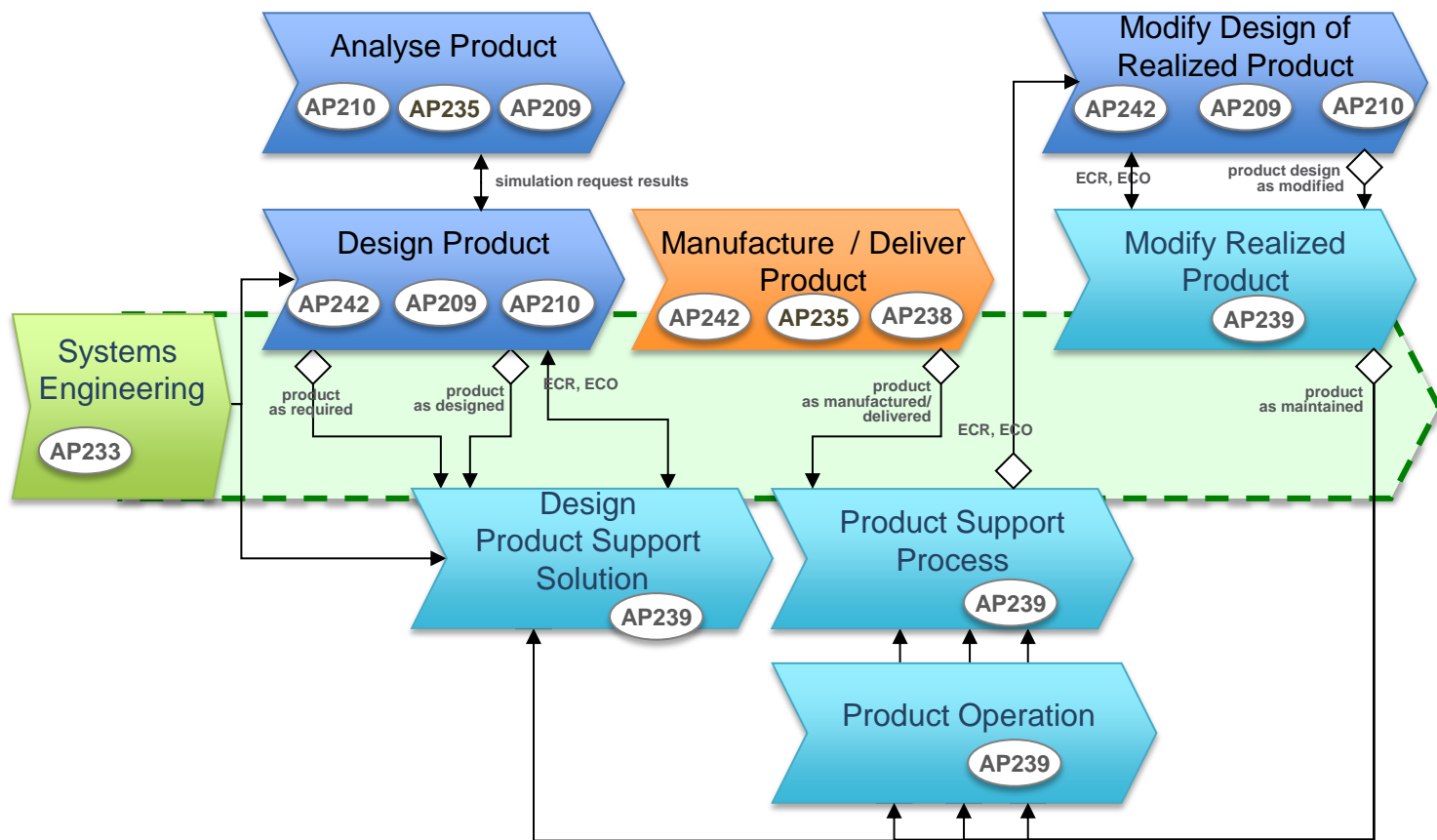
ISO 10303 is an International Standard for the computer-interpretable **representation and exchange** of product data. The objective is to provide a mechanism that is capable of describing product data throughout the life cycle of a product, independent from any particular system. The nature of this description makes it suitable not only for **neutral file exchange**, but also as a basis for implementing and **sharing product databases** and **archiving**.

**Figure 3-1. Multiple CAD/CAM Systems Used in the Automobile Supply Chain**

Multiple translators are required to exchange data between the various players in the U.S. automotive industry.



Source: AIAG. 1997a. "Product Data Exchange in the Automobile Supply Chains: AutoSTEP at the Midpoint." Southfield, MI: AIAG.



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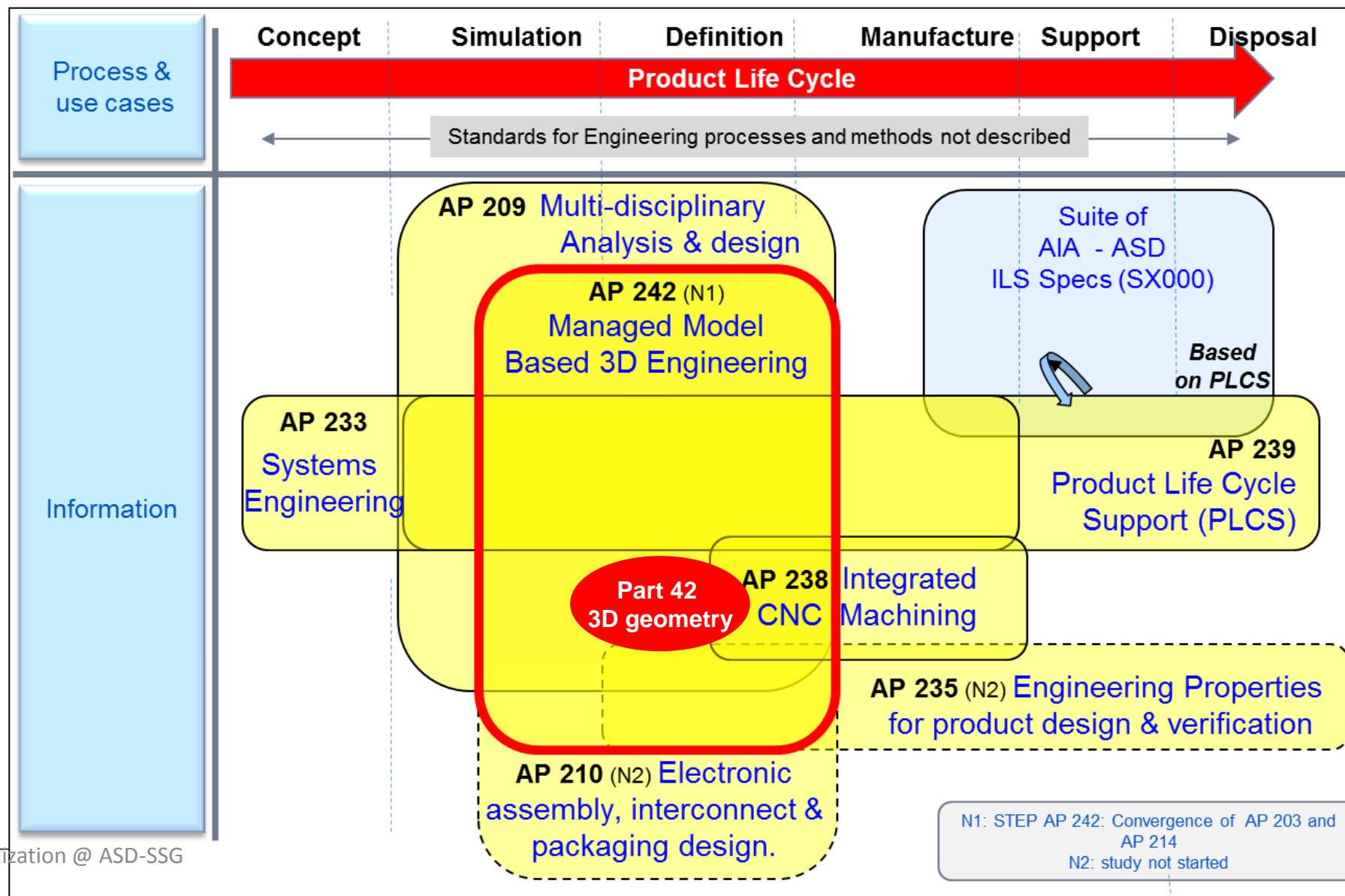
**STEP** *iso*  
10303

*STEP provides an integrated framework for the interoperability of the product data exchange and management along the life cycle of the product. The STEP framework is divided in Application Protocols.*





# Core suite of STEP standards for PLM interoperability : overview of STEP Application Protocols overlapping and sharing of the Part 42 geometry component





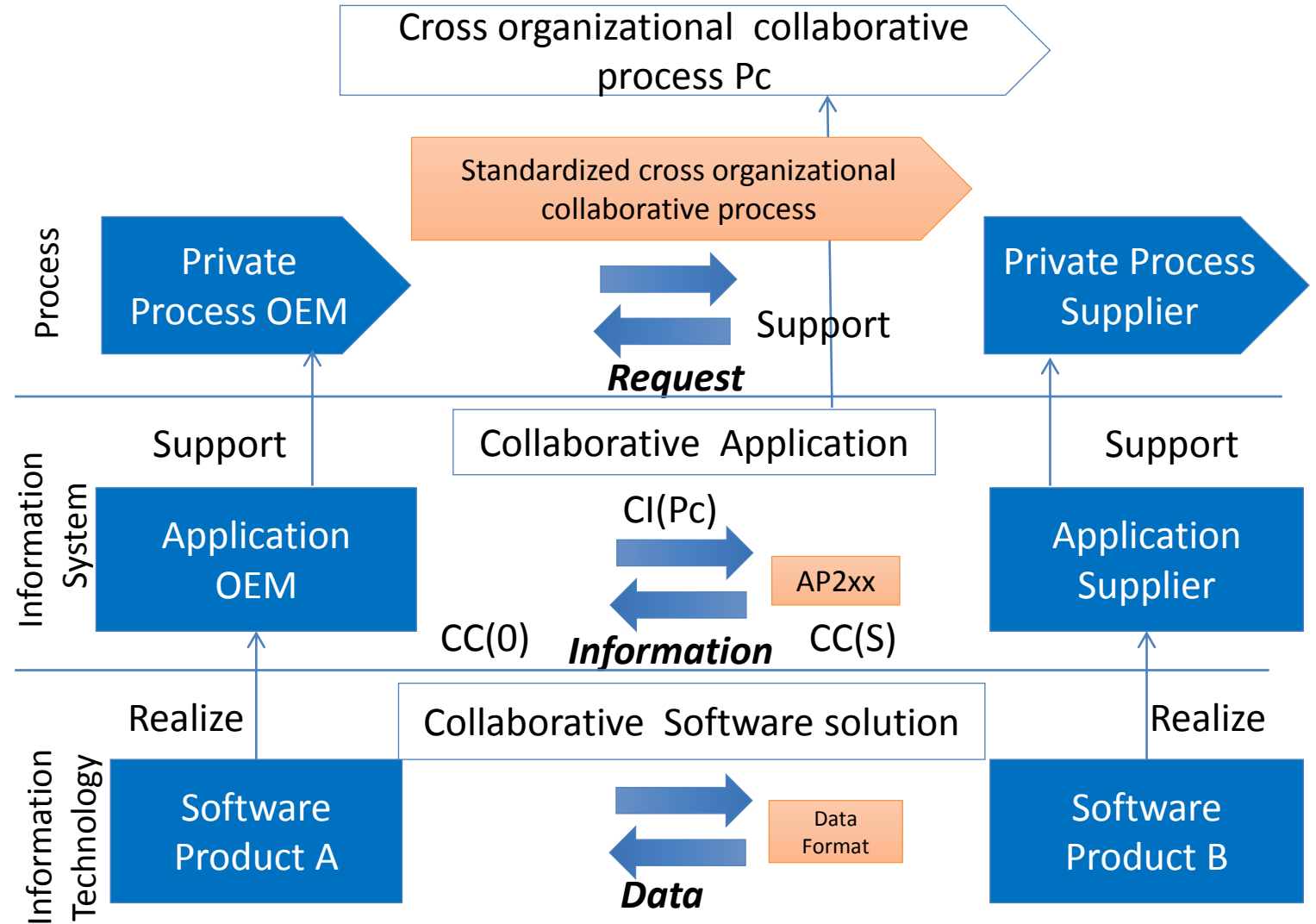
# STEP standards in the cross organizations proc

In the STEP standards, processes are defined as reference activities but they are not part of the standard.

Collaboration processes are defined in order to allow organization to collaborate while still keeping their own internal optimized processes.

The collaboration processes take advantage of the STEP standard.

**Until now, the management and decision processes were not the target of STEP.**





# Challenges for tomorrow

- Multiple implementation forms (XML, J-SON, ? zigmo++ ?)
- Broader community using the STEP information model
- Linked data architectures (STEP / OSLC)
- Hybrid solutions (STEP / X3D / JT / PDF3D)
- Ensuring security, quality , shape equivalence, persitent identification