



Why AI need
standardized
information models



Built Environment



Defence



Aeronautics



Space



ABOUT JOTNE IT

The leader in product data exchange and sharing
Jotne EPM Technology data products have
successfully reduced development and product
lifecycle costs through the use of intelligent data
management in the areas of Defence, Aeronautics,
Oil & Gas, Built Environment and Aerospace.



EMBEDDED INTELLIGENCE: TRENDS AND CHALLENGES

A STUDY BY ADVANCY, COMMISSIONED BY ARTEMIS INDUSTRY ASSOCIATION

CYBER-WORLD

Systems of Systems, Cloud/Fog/Edge computing, analytics and AI

- ▶ Data rich
- ▶ Software intense
- ▶ Application & services driven
- ▶ Allowing lateral interaction
- ▶ Decentralized

- The markets expected to almost double, from €1.7 t in 2016 to €3.2 t in 2025.
- **Interoperability standard** interfaces (both HW and SW), will be critical in reaping the benefits of Machine Learning/AI, particularly when it comes to new GPU/CPU environments. These are the underpinnings of the cloud and IoT revolution, as they ensure speed, ease and portability of data that is exchanged across distributed systems.
- **Interoperability & value delivery**, which will require seamless integration of different technologies – both hardware and software – through semantic interoperability and heterogeneous integration.



European Coordinated Plan on Artificial Intelligence (AI)

- Ongoing partnerships between the Member States and the Union through joint undertakings such as **ECSEL** ... are key to processing big data and sustain further developments in AI.
- In 2019 and 2020, under the **ECSEL Joint Undertaking**, AI and data analytics will be integrated in lighthouse initiatives in manufacturing, mobility and personalized medicine, with a total budget of around EUR 200 million, from components up to full systems.
- **Establishing world-reference testing facilities:** An important step in bringing technology to market relates to experimenting and testing state-of-the art technology in real-world environments.
- Action is needed to **facilitate sharing of data** held by public and private sectors by creating a common **European Data Space:** a seamless digital area with the scale that will enable the development of new products and services based on data.



E 6

AI has a data quality problem



**AI needs better data,
not just more data**

Big data is so often improperly formatted, lacking metadata, or “dirty,” meaning incomplete, incorrect, or inconsistent, that data scientists typically spend 80 percent of their time on cleaning and preparing data to make it usable, leaving them with just 20 percent of their time to focus on actually using data for analysis.

77% of professionals believe that interoperability is the largest challenge facing the industrial internet.

© survey by IoT Nexus



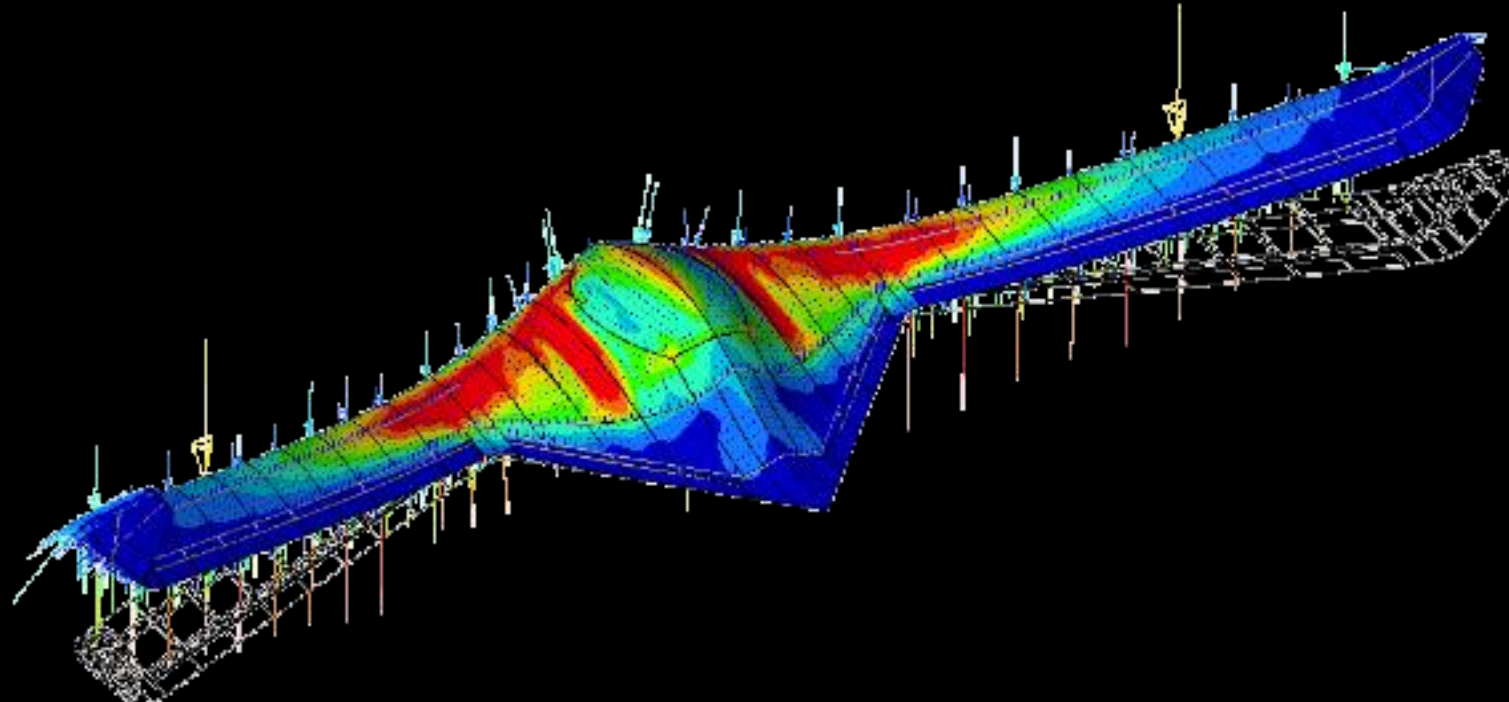
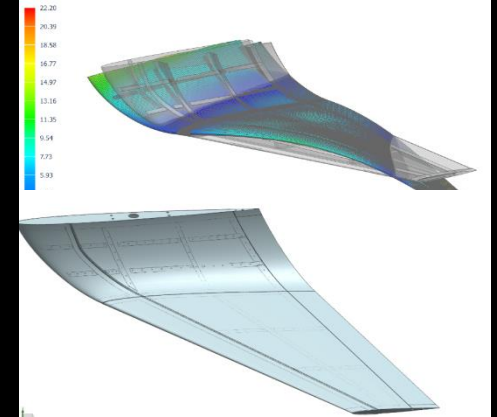
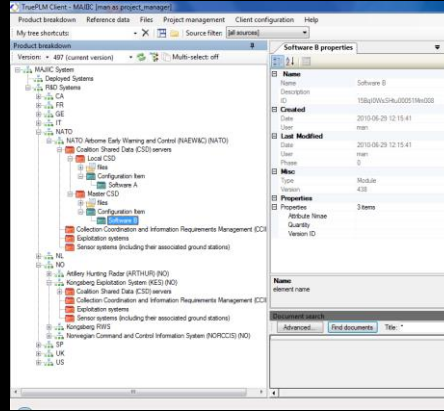
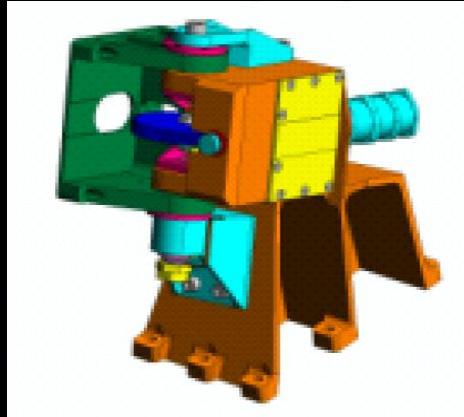
ISO 10303 STEP Standards development

1994: CAD
AP203

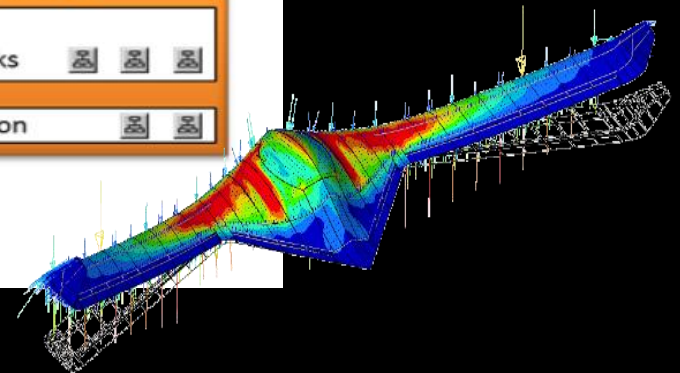
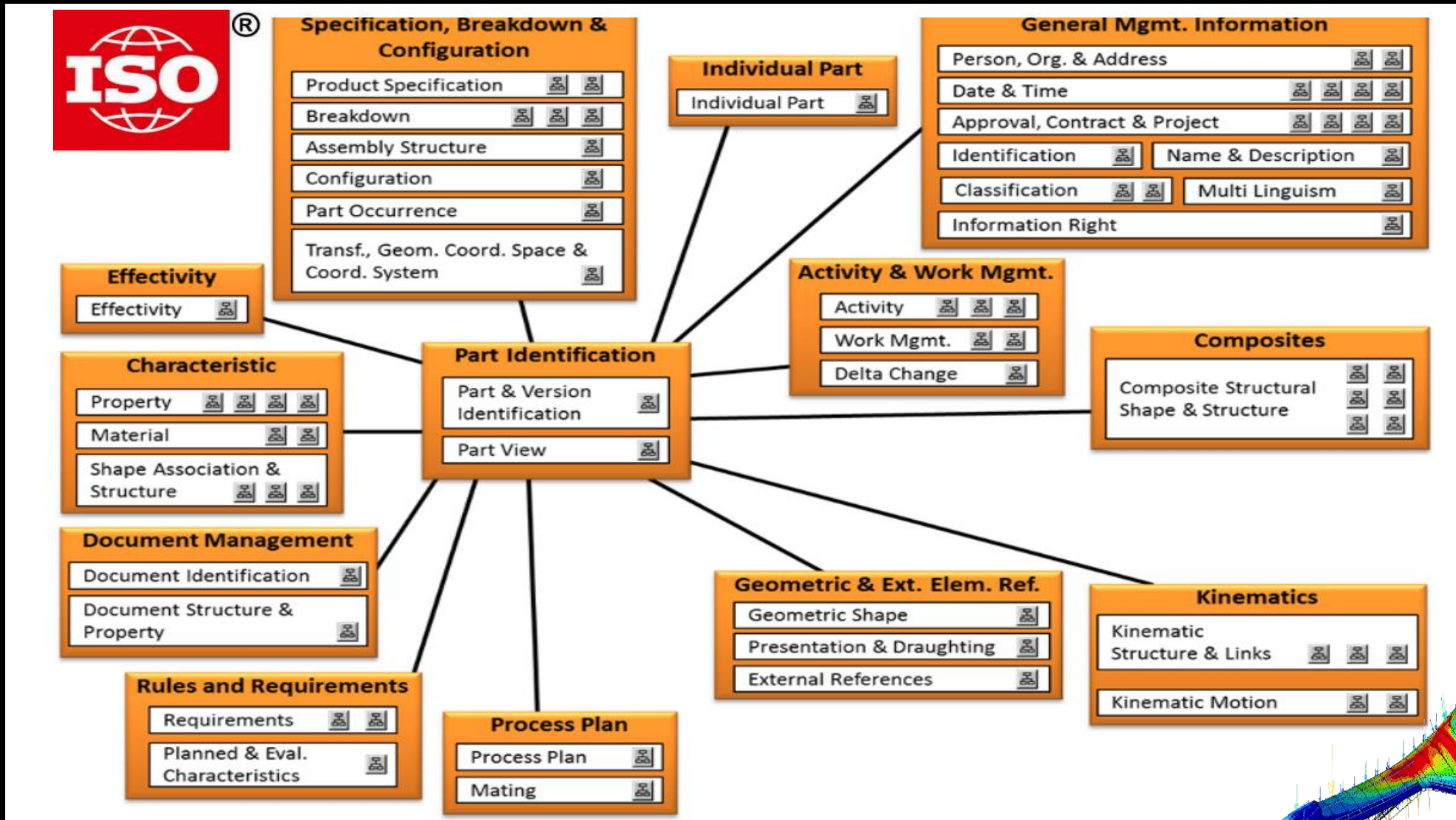
1999: PLM
AP214

2005: ILS
AP239

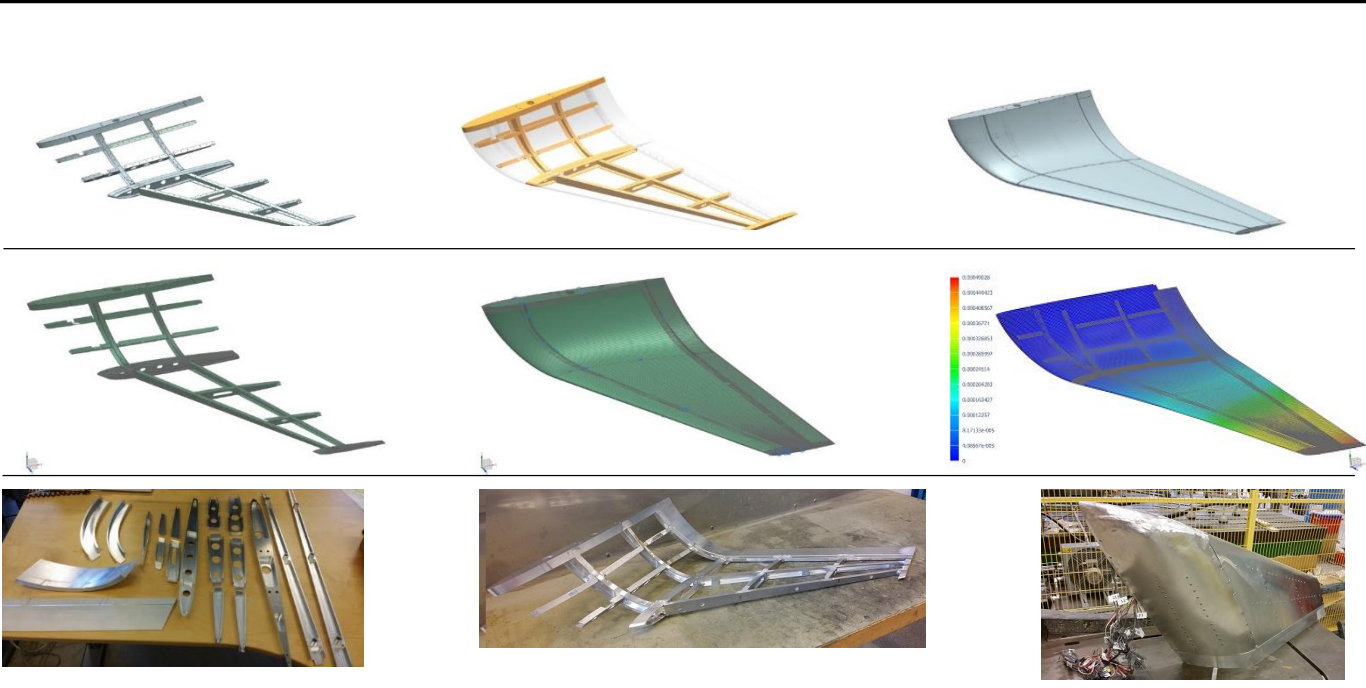
2014: CAE
AP242/209



What kind of information model do we have in ISO 10303 ?



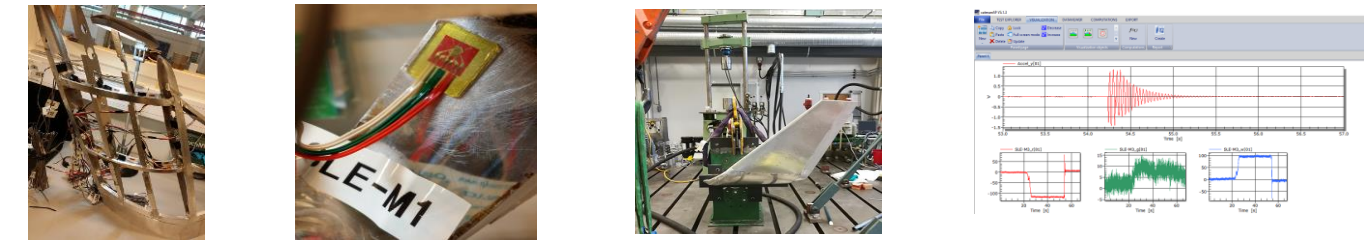
CAD, Simulation, Manufacturing, Test, Sensor and Operational Data in one standardized repository using ISO 10303. Facts or fiction?



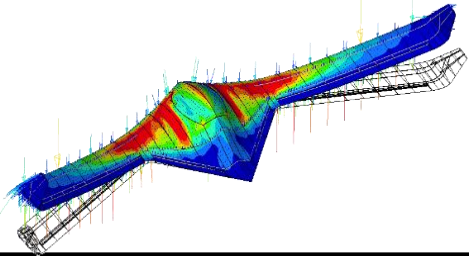
Design CAD

Analysis FEM

Manufacturing



Sensor data



ORGANIZATIONS THAT SUPPORTS ISO 10303



SOFTWARE VENDORS THAT IMPLEMENTS OPEN STANDARDS



How is STEP Used at Lockheed Martin

Geometric Data Exchange - AP 203, AP 242

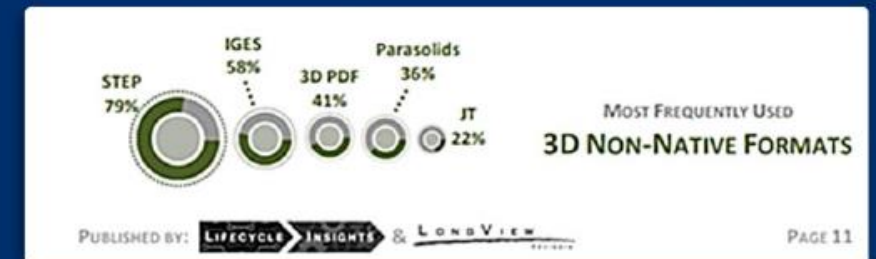
- Exchanging data between different systems (CAD, CAM, CAE, and PDM)
- Enabling 3D model information to integrate into non-CAD applications
- Supplier data exchange

Technical Data Package Core Information Exchange - AP 232

Supporting Various Aircraft Programs Including F-16, F-22, F-35, T-50, F-2 and C-130J

STEP converter development

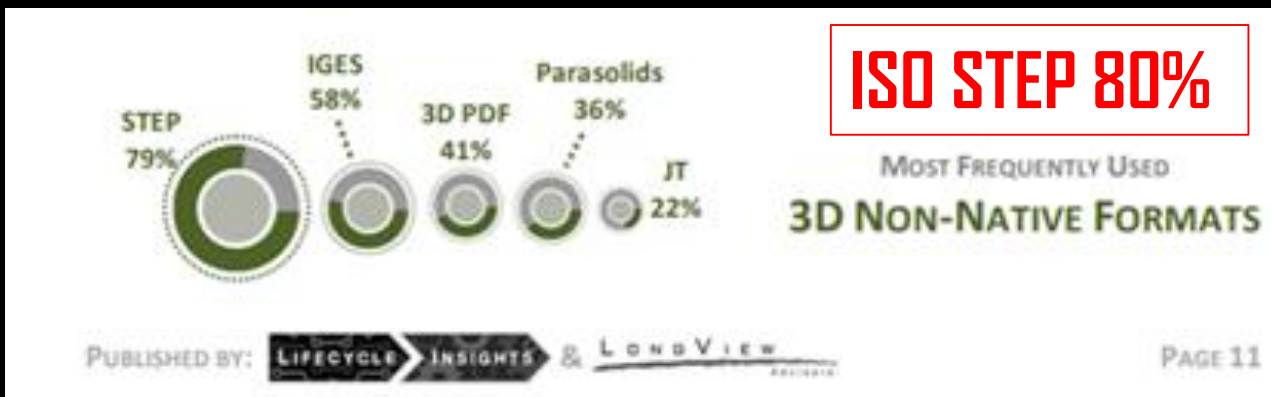
Lockheed Martin Handles 500,000+ STEP Files per year



Used in Eurofighter for last 20 years in PDM



BAE SYSTEMS



AMA
AEROSPACE INDUSTRIES
ASSOCIATION

**AEROSPACE INDUSTRY GUIDELINES
FOR IMPLEMENTING INTEROPERABILITY
STANDARDS FOR ENGINEERING DATA**

- **MBE will connect disciplines and modules across entire enterprise**
- **Common understanding of different processes and data disciplines**
- **Use terms and definitions to provide interoperability for data exchange, sharing and archival processes**



Conclusions: The challenges of the Information Age



- Interoperability of information technology, addressed by data exchange & sharing solutions
- Common enterprise-wide views of information, addressed by data integration solutions
- Obsolescence of information technology, addressed by data archiving solutions
- Freedom from vendor lock-in, addressed by open data solutions
- Multiple viewpoints, addressed by solutions embodying data independence