LOTAR

LONG TERM ARCHIVING AND RETRIEVAL

The LOTAR international project, link with the governance of open PLM interoperability standards

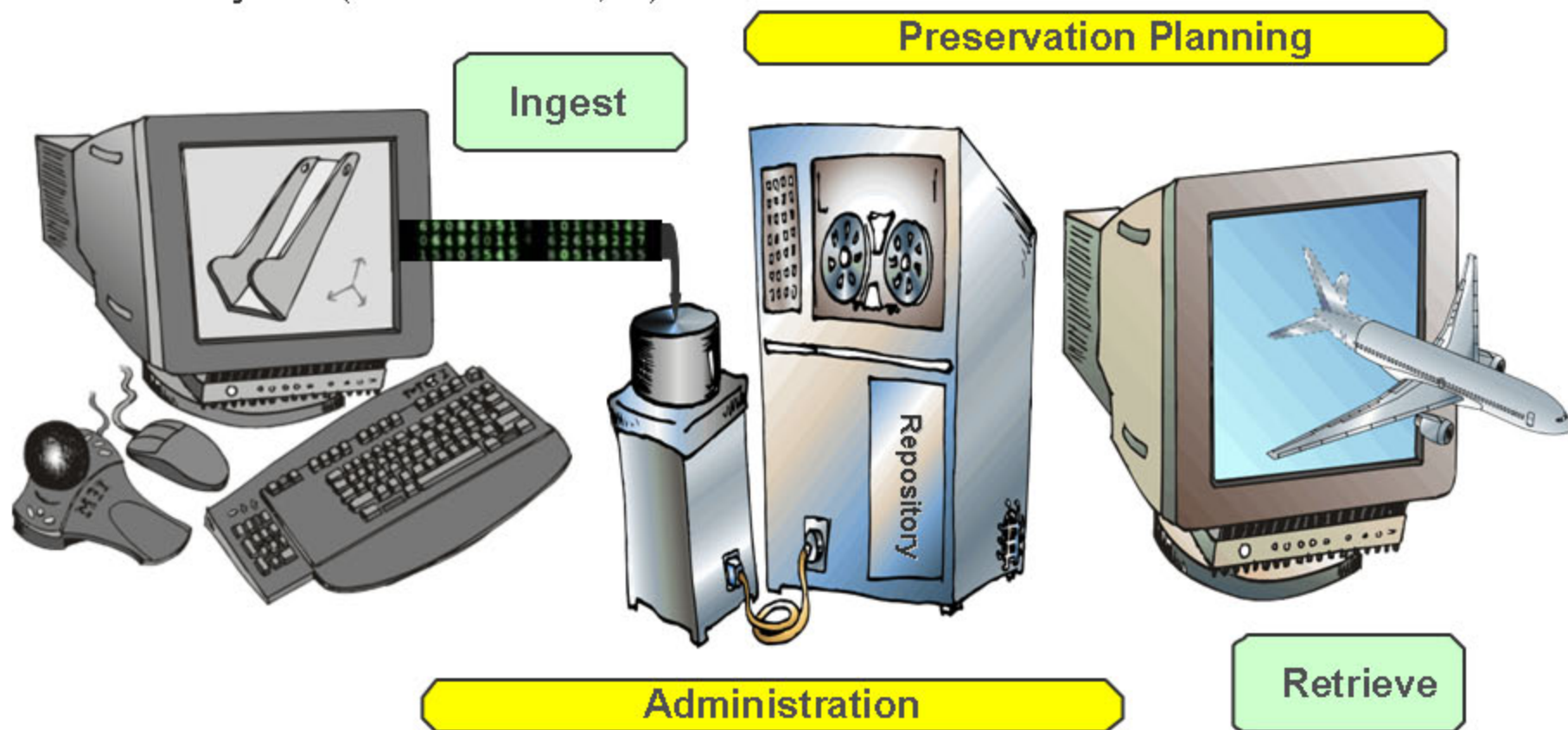ProSTEP iViP Symposium
4th of April 2011

Presented by JY Delaunay (EADS Airbus)

AIA – ASD Stan LOTAR co-project leader

AIA ASD-STAN
Standardization
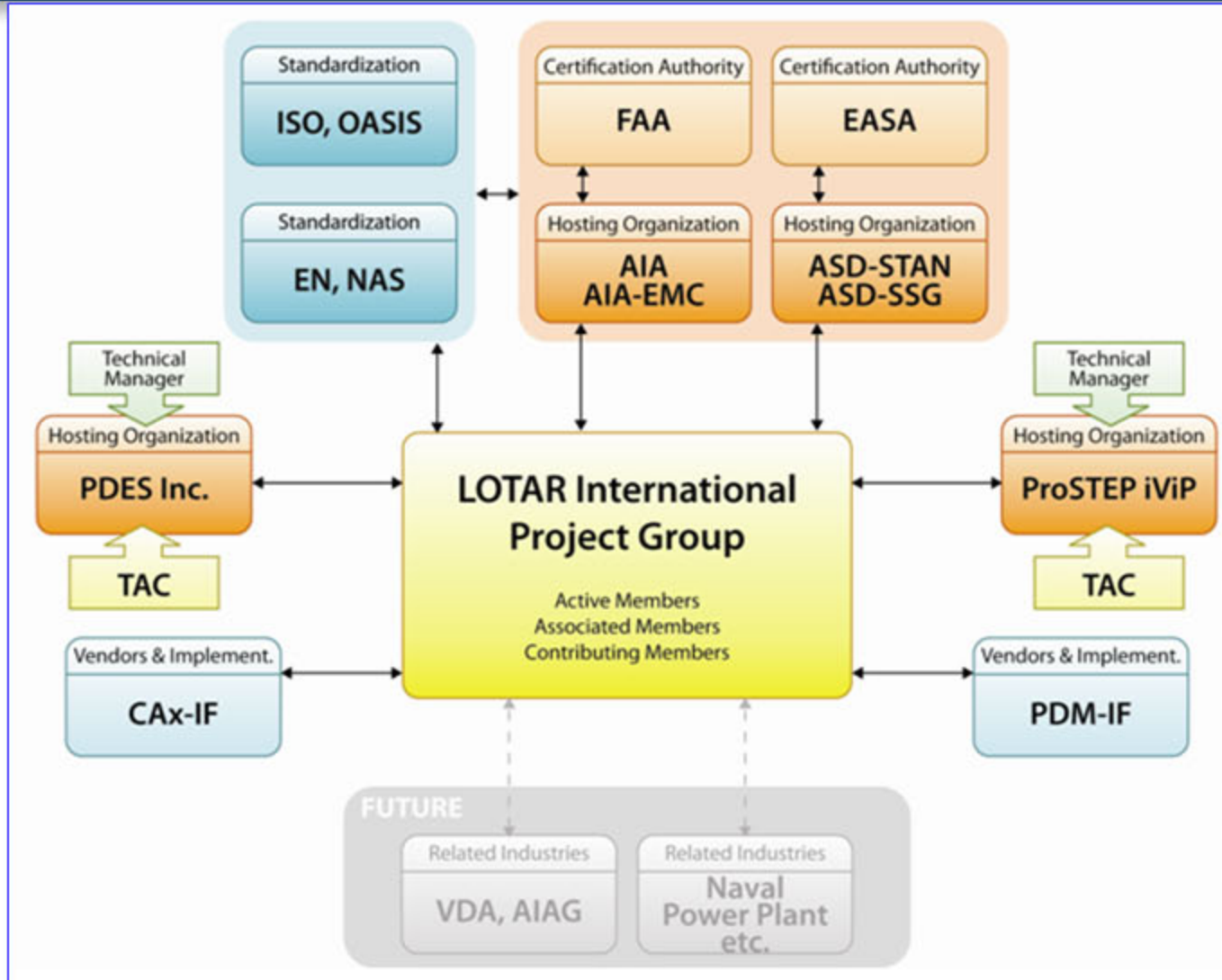
ProSTEP iViP

PDES, Inc.

- Overview of the LOTAR project

- Overview of the LOTAR standards

- Link with the governance for aerospace and defence standards
  - Case of the ASD SSG (Strategic Standardization Group)

- CAD S/W versions change every **6 to 12 months**, CAD generations change every **10 years**.

- Aircraft lifecycle of **70+ years**

- The Lifecycle of software & hardware is short compared to the lifecycle of an aircraft or a defence system (nuclear missile, ...)

Ingest

Preservation Planning

Repository

Administration

Retrieve

AIA ASD-STAN

ProSTEP iViP PDES, Inc.

LOTAR International project and external relationships
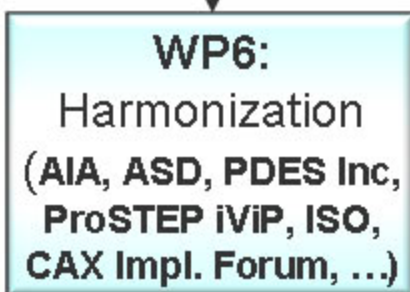
Planned LOTAR members for 2011

- **European A&D members**
  - EADS Airbus
  - EADS Cassidian
  - EADS Eurocopter
  - Dassault-Aviation
  - Israel Aerospace Industry
  - Safran (to be confirmed)
  - Other: ProSTEP iViP

- Potential new partner from UK:
  Nuclear Weapons systems,
  interested by LT Archiving of Electrical Harness

- **American A&D members**
  - BAE Systems
  - Boeing
  - General Dynamics
  - General Electric
  - Goodrich
  - Honeywell
  - Lockheed Martin
  - Sandia National Labs
  - Spirit
  - Embraer (in progress)
  - Bombardier (in progress)

LOTAR 2011 WBS

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```
                    WP0:
             Project Management

WP1:              WP4:              WP6:              WP7:
Development        Implementation of  Harmonization    Communication
of Basic Parts    Pilot Projects     (AIA, ASD, PDES Inc,  (FAA, EASA, …
                                     ProSTEP iViP, ISO,    IT Vendors,
                                     CAX Impl. Forum, …)   Standardization)

WP2:              WP5:
Development        Development of
of Common         L-T Archiving
Process Parts     Rec. Practices

WP3:
Development
of Data Domain
Specific Parts
```

Active participation of A&D manufacturers, coordination with standardization associations
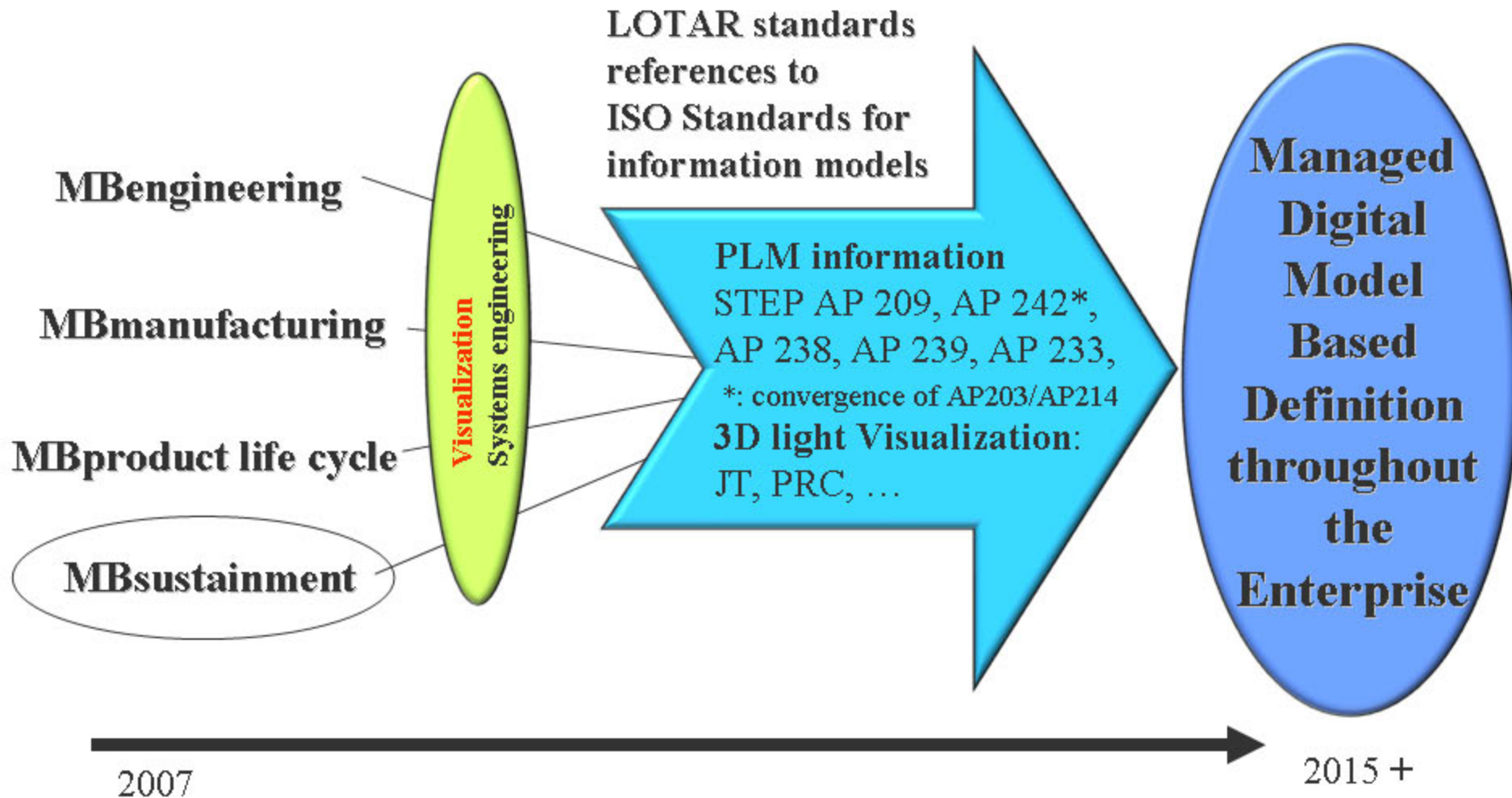
- **4 international LOTAR workshops per year:**
  - 21 - 26 Mar 2011   USA, PDES Inc (parallel to the PDES Offsite)
  - 7 - 9 June 2011   Europe, Toulouse, Airbus
  - 19 - 22 Sept. 2011   USA, PDES Inc (parallel to the PDES Offsite)
  - 6 - 8 Dec 2011   Europe, Darmsradt, ProSTEP iViP

- **Weekly teleconferences of the main WGs**
  - PDM WG, CAD 3D PMI WG, CAD 3D composite WG
  - Coordination team

- **Coordination with A&D and PLM standardization associations**
  - Aerospace and Defence manufacturers associations: AIA and ASD
  - PLM Standardization associations: PDES Inc and ProSTEP iViP

Fundamentals and concepts of the LOTAR project

- **Use of ISO OAIS** (Open Archive Information Model)

- **L-T Preservation based on international open standards**

- **Methods:**
  - Business requirements,
  - Business processes and uses cases,
  - essential information
  - Validation properties and verification rules
  - Implementation pilots

- **ISO TC/184 SC/4 "STEP" as the suite of standards covering the full A&D product life cycle and the technical disciplines:**
  - E.g.: LOTAR involvement in the STEP AP 242 project
  - Other ISO standards in study for LTA of 3D visualization: JT, U3D/PRC, …

MBengineering

MBmanufacturing

MBproduct life cycle

MBsustainment

Visualization
Systems engineering

LOTAR standards
references to
ISO Standards for
information models

PLM information
STEP AP 209, AP 242*,
AP 238, AP 239, AP 233,
*: convergence of AP203/AP214
3D light Visualization:
JT, PRC, …

Managed Digital Model Based Definition throughout the Enterprise

2007

2015 +

Overview of NAS 9300 - EN 9300 LOTAR standards
A architecture for extensions
according to business needs

LOTAR
LONG TERM ARCHIVING AND RETRIEVAL

Information Domain specific parts

CAD Mechanical 3D Geometry with PMI and Assembly

Product Management Data

Composite design and manufacturing

Electrical systems

Systems Engineering

Simulation

...

| P1XX | P2XX | P3XX | P4XX | P4XX | P4XX | P4XX |

Common Process Parts
(Common processe, Data preparation, Ingest, Archival Storage, Retrieval, …)

Basic parts
(Overview Requirements, Fundamental,s Methods, …)

march 2008

LOTAR Overall Project Plan 2011-2015

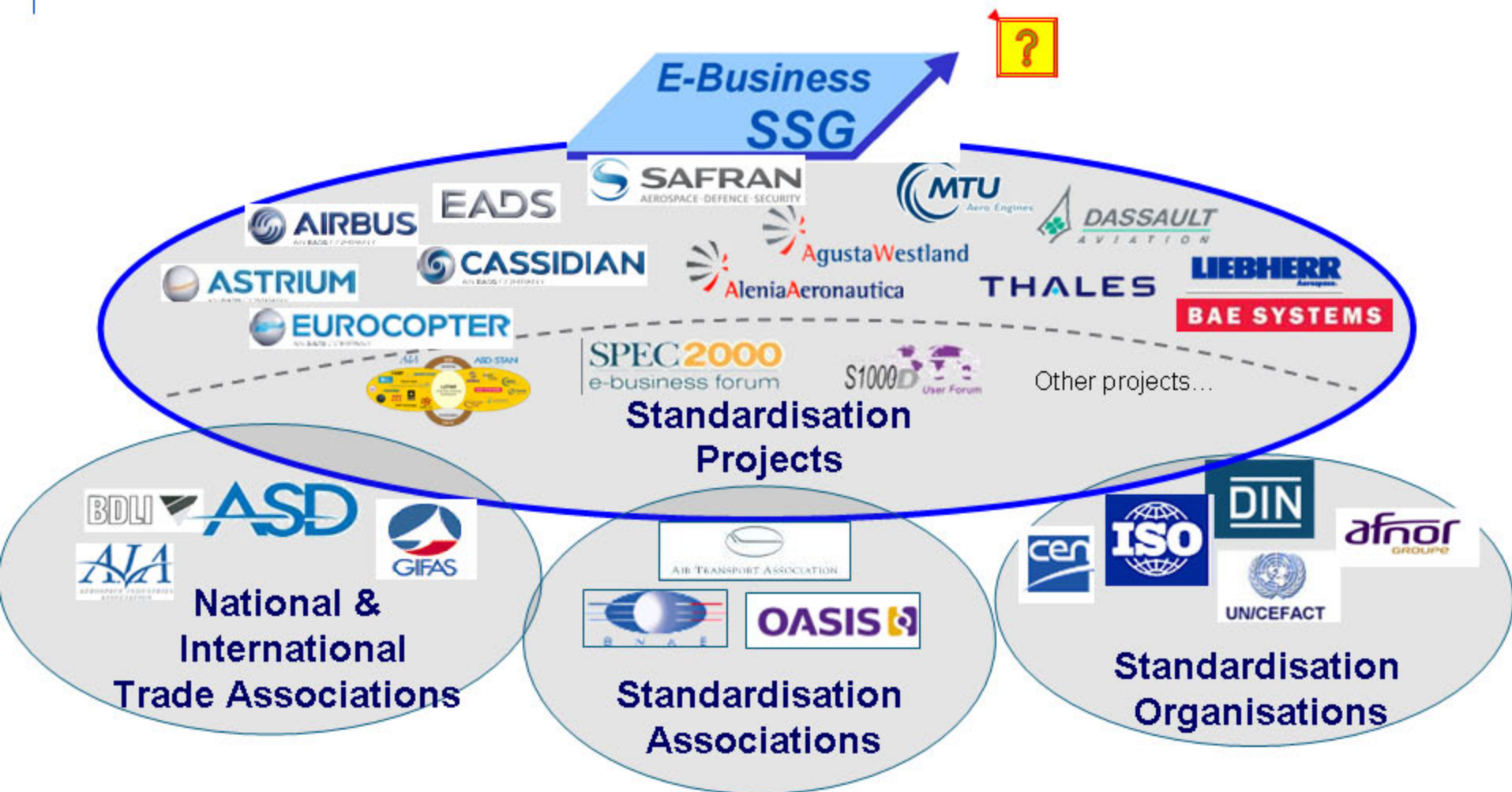|		2010		2011		2012		2013		2014		2015	
		S1	S2	S1	S2	S1	S2	S1	S2	S1	S2	S1	S2
III - Basic & common parts													
006	Functional architecture								X				
007-v(x)	Terms and references				V2				V3				V4
008	Security								X				
020	Governance and Planning				X								
120-v1	LTA of CAD 3D with PMI "polyline presentation"				X								
120-v2	LTA of CAD 3D with PMI "full representation"								X				
125-v1	LTA of CAD 3D assembly with PMI											X	
IV - Domains specific parts													
1xx	LT Archiving of 3D light visualization												
200	LTA of PDM information - fundam. & concepts							X					
210	LTA of PDM information "As design"							X					
220	LTA of PDM information "As planned"										X		
3XX	LTA of CAD 3D composite design								X				
4XX	LTA of CAD 3D electrical harness												X
V - Harmonization with other project													
	Support of the CAX IF					**Recurring**							
	Development of STEP AP 242 ed1 (then ed 2)					**Recurring**							
VI - Communication													
	With certification authorities					**Recurring**							
	LOTAR web site					**Recurring**							

LOTAR 2010 main achievements

L O T A R
LONG TERM ARCHIVING AND RETRIEVAL

- LOTAR international charter
- New LOTAR international web site: www.lotar-international.org
- LOTAR Standards development, to be sent for ballot in 2011:
  - P120-V1: LT Archiving & Retrieval of CAD 3D PMI "polyline presentation"
  - P20 "Governance and planning"
- Pilots:
  - Catia V5 prototype for LT Archiving of CAD 3D composite in AP203ed2
  - 2 pilots for LT Archiving of PDM information based on STEP AP239 PLCS
- Close coordination with the CAX Implementer Forum
- Contributions to the STEP AP 242 project
- => **Results**: Use of LOTAR standards for LT Archiving of 3D PMI:
  - In operation: Snecma, Dassault-Aviation,Gulstream
  - In Development: Airbus, Boeing

Development of LOTAR standards and governance of PLM interoperability standards

- Identification of **strong needs of coordination between the LOTAR project and other standardization projects:**

  - LT preservation of **CAD 3D PMI "full representation" information**
    - Coordination between the LOTAR project, the CAX IF, STEP AP 242

  - LT preservation of **3D PMI light visualization**
    - Coordination between the LOTAR project, JT (standard, IF, ...), PRC, ...

  - LT preservation of **PDM information**
    - Coordination between LOTAR, STEP AP 242, STEP AP 239 PLCS,

  - LT preservation of **3D electrical harness information**
    - Coordination between LOTAR, STEP AP 242 ed.2, VDA VEC , ...

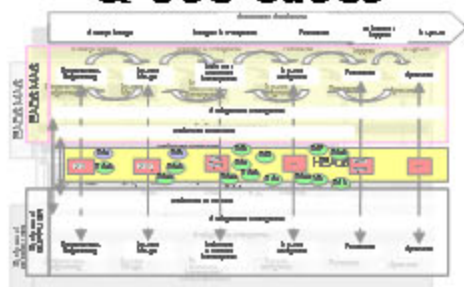# LOTAR A&D standards, part of US & European A&D PLM standards coordination

- The LOTAR international project reports to the US and European Aerospace and Defence associations
  - AIA : AIE EMC Engineering Manufacturing Council
  - ASD : ASD SSG "Stategic Standardization Group"

- AIA and ASD have set up specific organizations in charge of the coordination of the overall consistency of eBusiness / PLM standards for Aerospace & Defence products
  - Sharing of common methods and practises,
  - Regular coordination between the 2 organizations

- Illustration in the case of the ASD SSG

ASD Strategic Standardization Group (SSG)
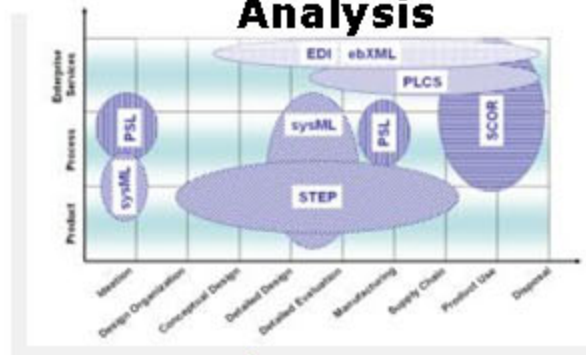## Organization & Activities

Interoperability framework: organizing the tools
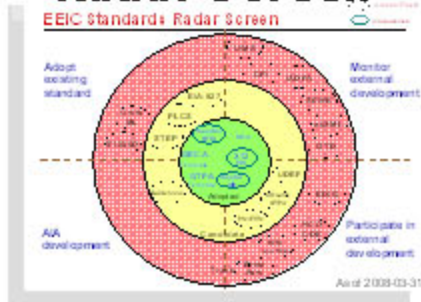## to master business requirements and consistency

Business Scenario & Use Cases

Identify & describe the need

Life Cycle Gap Analysis

Radar Screen

Address the need

Roadmap

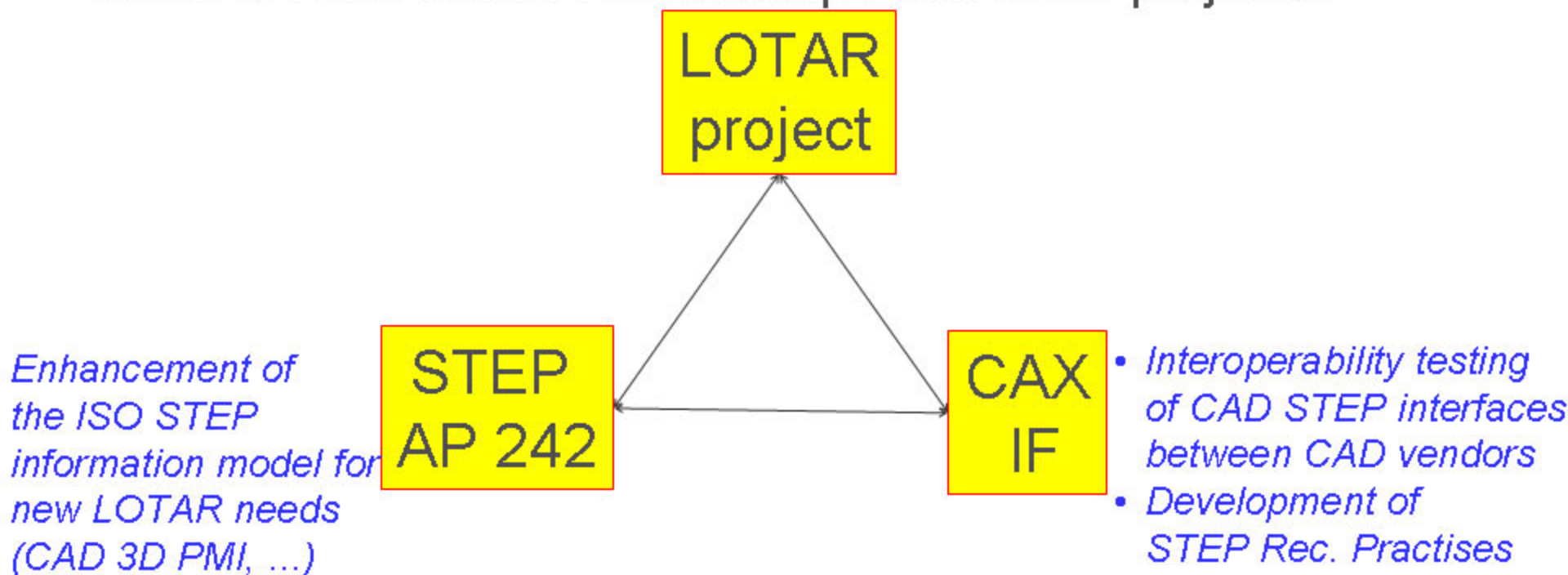**Develop standards & policies**

- The goal of the LOTAR project is to develop standards, in order to have successful operational solutions approved by the regulatory authorities (FAA, EASA)

- Need to have formal relationships with other projects:

LOTAR project

Enhancement of the ISO STEP information model for new LOTAR needs (CAD 3D PMI, …)

STEP AP 242

CAX IF

- *Interoperability testing of CAD STEP interfaces between CAD vendors*
- *Development of STEP Rec. Practises*

Preparation of the coordination between the LOTAR WG for CAD 3D Elec Harness and the STEP AP 242 V2 project

2011　　2012　　2013　　2014　　2015

LOTAR parts 4XX for CAD 3D elec Harness

Data model based on

STEP AP 242 ed2 including CAD 3D elec Harness

Start

Sept. 2011

Part 400 & 410 send for ballot

Preliminary planning for discussion

Requirements for the scope of AP 242 ed. 2

Planned start of AP 242 ed. 2

AP 242 ed. 2

IS

Sept. 2011

Preparation of STEP modules

ASD-STAN ProSTEP iViP PDES, Inc.

Summary – next actions

LOTAR

- The LOTAR project delivers results with the development of new capabilities, based on U-Cs, standards, rec. practises and pilots.

- Increasing participation of US and European A&D companies.

- The next objectives are the LOTAR standards for:
  - **CAD 3D PMI "full representation"** (part and assembly levels)
  - **PDM information,**
    - based on the compatibility of STEP AP 242 and STEP AP 239 PLCS / AP 233
  - **CAD 3D composite design and CAD 3D electrical harness**
    - based on the compatibility of STEP AP 242 ed.1 / AP 209 and AP 242 ed.2
  - **3D light visualization**
    - based on the compatibility STEP AP 242 and JT / PRC visualization standards

- **The LOTAR project relies on close cooperation with other standardization projects and other industrial sectors**
  - Automotive industry: STEP AP 242, JT, VDA VEC, …
  - Others: PDES Inc LT Retention project, STEP AP 239/233, STEP AP 209, PRC…

Back up slides

ASD SSG Radar screen - Jan. 2011 (Similar radar screen for AIA EEIC)

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Last revised: 2011-01-11

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ASD SSG Activities

Working Groups (WG)

- Communication & Reporting
- Industry Requirements & SSG Business Roadmap
- Coordinating with AIA
- SSG Radar Screen & Interoperability Framework
- ILS
- CAD Interoperability and visualisation
- SCM Standards Policy
- Hub Collaboration
- PDM Standards Policy