

PLM Road Map™ & PDT EMEA 2022

*Digital Transformation and PLM – a call for PLM professionals to
re-define and re-position the benefits and value of PLM*

CIMdata

18-19 October

-eurostep-



AEROSPACE & DEFENSE PLM ACTION GROUP

Roadmap for Enabling Global Collaboration

Bernd Feldvoss – Value Stream Leader PLM Interoperability Standards, Airbus

Administered by:

CIMdata | Global Leaders in PLM Consulting
www.CIMdata.com

1

Agenda

- Collaboration Team
- AD PAG History Global Collaboration Paper Edition 2
- AD PAG CMS Global Collaboration Paper and Guidelines
- Digital CMS Application
- AD PAG Next Steps

Administered by **CIMdata**

**AEROSPACE & DEFENSE
PLM ACTION GROUP**



2

**AEROSPACE & DEFENSE PLM
ACTION GROUP**



Presenters Bio

Bernd Feldvoss
Value Stream Leader PLM Interoperability Standards

Email: Bernd.Feldvoss@airbus.com



Bernd Feldvoss is the Value Stream Leader PLM Interoperability Standards at Airbus in Hamburg, Germany. Bernd joined Airbus in 1998 and worked as a Systems Engineer where he was involved in the development of Data Exchange Methods. During this time he participated in international working groups and made a contribution to the "Airbus Concurrent Engineering (ACE)" project. He was also a member of the ACE-DSE (Data Sharing and Exchange) working group where he was involved in projects including the launching of the A380 and establishing cDMU between the UK, Spain, France, and Germany. Additionally, Bernd has participated in several European Research Projects including Muscles and ENHANCE-COMEX.

In 2006, Bernd was appointed as the Team leader for Product Data Exchange at Airbus Germany where he managed 15 internal and external employees. He was appointed to his current role in 2022. As part of his professional life, Bernd represents Airbus on numerous committees including; the ProSTEP iViP Technical Steering Committee and the JT Open Technical Review Board. He is also a member of the Global Collaboration Working Group in the CIMdata managed PLM Aerospace & Defense Action Group.

Bernd studied Computer Science at the University of Hamburg, where his focus was on Computer Aided Engineering. He has also made numerous presentations at globally recognized conferences.

Administered by CIMdata

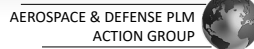


3

A&D PLM Global Collaboration – Abstract (1 of 2)

- Collaboration among Original Equipment Manufacturers (OEMs) and their product design and manufacturing engineering partners and suppliers is key to any major aerospace and defense (A&D) program.
- Process analysis by an A&D PLM Action Group (AD PAG) project team has shown that the exchange of product data, such as 3D-MBD, Bill of Materials (BOM), and Model-Based Engineering (MBE), between multiple OEMs and suppliers presents a challenge within the industry.
- Currently, the exchange methods for long-term collaboration between OEMs and suppliers are independent and utilize exclusive environments and protocols, each unique and complex. Improving the consistency and efficiency of establishing and managing OEM-supplier collaboration can significantly improve cost, schedule, and quality across all phases of the product lifecycle.

Administered by CIMdata



4

A&D PLM Global Collaboration – Abstract (2 of 2)

- This presentation offers a new “Desired State” for OEM-supplier collaboration through the application of and adherence to a set of guidelines defined by the project team.
- The A&D PLM Collaboration Guidelines lay out eight standard and repeatable steps for establishing and managing the environment where OEMs and suppliers collaborate.
- To facilitate the adoption of the A&D PLM Collaboration Guidelines, the project team has developed an open-service Collaboration Management System (CMS) web application.
- The CMS encapsulates and provides navigation through the eight-step guidelines and offers the potential to improve OEM-supplier collaboration consistency and efficiency within the A&D community.

Administered by CIMdata

AEROSPACE & DEFENSE PLM
ACTION GROUP 

5

A&D PLM Global Collaboration – Participants

AIRBUS

BOEING

Gulfstream[®]
A GENERAL DYNAMICS COMPANY



Rolls-Royce

SAFRAN

Project Lead: Robert Gutwein, Pratt & Whitney Canada

Project Specialist: Bernd Feldvoss, Airbus

CIMdata Team Coordinator: Ken Versprille, CIMdata

Administered by CIMdata

AEROSPACE & DEFENSE
PLM ACTION GROUP 

6

AEROSPACE & DEFENSE PLM
ACTION GROUP



A&D PLM Global Collaboration - Team Objective

- The Aerospace and Defense Product Lifecycle Management Action Group (AD PAG) is an association of aerospace Original Equipment Manufacturers (OEMs) and aircraft engine manufacturers within CIMdata’s globally recognized PLM Community Program, which functions as a PLM advocacy group.
- One of the key business issues (i.e., pain points) identified by this industry group is that collaboration within a large, global, distributed supply chain of design and development partners is seriously hindered by relying on traditional, document-based development processes. As such, a major business challenge identified by the group is to achieve OEM and supply chain collaboration through bi-directional exchange of Technical Data Packages (TDPs) via digital tools and model-based processes.
- In response, a project team of domain experts from the AD PAG member companies was established to evaluate current collaboration practices.

Administered by CIMdata



7

A&D PLM Global Collaboration - Ontology

- The original use cases and collaborative concepts were evaluated in the development of desired collaboration framework.
- To better understand the context of collaboration framework, the key terms that the team considered are identified in a word cloud.



Administered by CIMdata



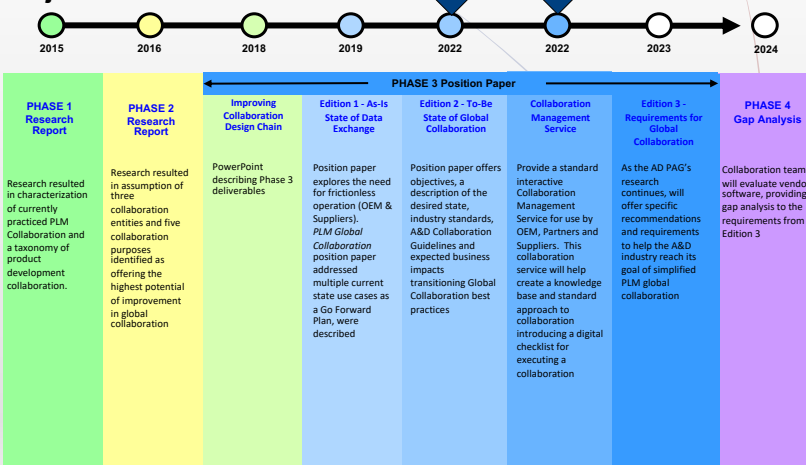
8

A&D PLM Global Collaboration – Timeline and Status

□ **Edition 2 describing the To-Be State of Global Collaboration published supporting Standards and Aerospace Guidelines**

□ **Collaboration Management System (CMS) Paper and Web application published to help digitize and implement Collaboration Guidelines**

Project Timeline



Administered by CIMdata



A&D PLM Action Group - Publications & Teams

Aerospace & Defense PLM Action Group

- Home: Aerospace & Defense PLM Action Group
- Members
- Mission
- Publications ▾
 - Glossary
 - Digital Twin Digital Thread
 - Global Collaboration
 - Model-Based Definition and BOM Definition
 - Model-Based System Engineering
 - Multi-view Bill of Materials
 - PLM Technology Obsolescence Management
 - Standards

HOME > HOME: AEROSPACE & DEFENSE PLM ACTION GROUP



Founded in 2014, the Aerospace & Defense PLM Action Group is an association of aerospace & defense companies within CIMdata's globally recognized PLM Community Program, which functions as a PLM advocacy group.

Our stated mission is to:

- > Set the direction for the aerospace & defense industry on PLM-related topics that matter to members
- > Promote common industry PLM processes and practices
- > Define requirements for common interest PLM-related capabilities
- > Communicate with a unified voice to PLM solution providers
- > Sponsor collaborative PLM research on member-prioritized industry and technology topics

[Our Members](#)

Home page:

www.ad-pag.com

Administered by CIMdata



A&D PLM Collaboration Team - Publications

The screenshot shows the website for the Aerospace & Defense PLM Action Group. The main navigation includes RESOURCES, EDUCATION, CONSULTING, RESEARCH, MEMBERSHIPS, and EVENTS. The page title is 'Aerospace & Defense PLM Action Group'. The 'Publications Global Collaboration' section features two articles:

- PLM Global Collaboration Release 2.0**: A Position Paper dated March 12, 2022, discussing collaboration among Original Equipment Manufacturers (OEMs) and their product design and manufacturing engineering partners and suppliers.
- Global Collaboration - Defining a baseline for data exchange processes and standards**: A Presentation dated February 2, 2021, discussing the exchange of Product Data Management (PDM) data between disparate PDM solutions.

A URL is provided: <https://www.cimdata.com/en/aerospace-and-defense/publications/global-collaboration>

Administered by CIMdata

AEROSPACE & DEFENSE PLM ACTION GROUP

11

A&D PLM Global Collaboration – Collaborative Communities

- A collaborative community is **two or more people from different groups or companies working jointly on a project.**
- As shown in the following figure, a collaborative community's main **objective is to efficiently design, manufacture, and support components throughout their lifecycle.**

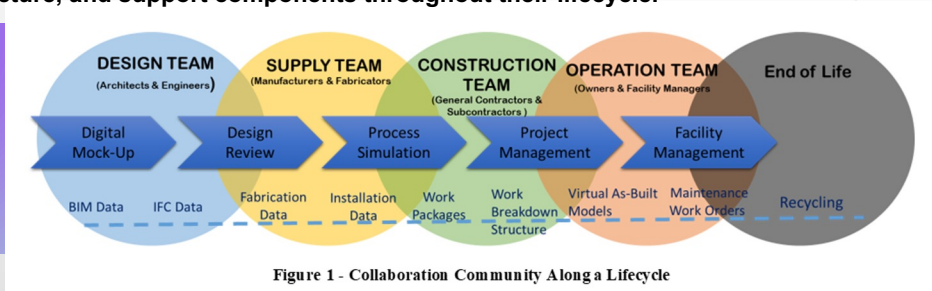


Figure 1 - Collaboration Community Along a Lifecycle

- Collaborative communities **must support collaboration, brainstorming, and innovation in real-time.**
- As stated in the Overview of the Desired Interactions between Business Entities section, collaborative community participants **must also respect a common agenda to reach program milestones.**

Administered by CIMdata

AEROSPACE & DEFENSE PLM ACTION GROUP

12

A&D PLM Global Collaboration – Collaboration Evolution

SUPPLIER AGREEMENTS
 NEED TO EVOLVE INTO FLEXIBLE CONTRACTS SUPPORTING MODEL-BASED DEVELOPMENT WITH ADVANCED COLLABORATION METHODS

DOCUMENT BASED DEFINITION of product with limited distribution and delayed communication through (paper, mail, scan/fax)

ELECTRONIC DEFINITION of product disrupted decades of industry standard practice with data transfer

CONNECTIVITY TECHNOLOGY, DATA FORMAT, intellectual property, and level of detail quickly rose as inhibitors to electronic data definition and transfer

COLLABORATION IS NEEDED during all phases of program lifecycle. Levels of frequency and volumes will vary at each phase, which will determine the level of interconnectivity and interoperability.

A&D PLM Collaboration Industry Standards

Standard	Publication Year	Title
ISO 11354	2011	Advanced automation technologies and their applications — Requirements for establishing manufacturing enterprise process interoperability
ISO 11354-2	2015	Advanced automation technologies and their applications — Requirements for establishing manufacturing enterprise process interoperability — Maturity model for assessing enterprise interoperability
ISO TR44000	2019	Principles for successful collaborative business relationship management
ISO 44001	2017	Collaborative business relationship management systems — Requirements and framework
ISO 44002	2019	Collaborative business relationship management systems — Guidelines on the implementation of ISO 44001
ISO 44003	2021	Collaborative business relationship management — Guidelines for micro, small and medium-sized enterprises on the implementation of the fundamental principles
ISO 44004	2021	Collaborative business relationship management — Guidelines for large organizations seeking collaboration with micro, small and medium-sized enterprises (MSMEs)
Mil Std 31000	Rev - 2009 Rev A - 2013 Rev B - 2018	Provides requirements for the deliverable data products associated with a TDP and its related TDP data

ISO 44001 Checklist

Appendix B: ISO 44001 Assessment Checklist¹

Stage	ISO 44001 Collaboration Stages	Status
1	Operational Awareness	
	1.1 Overall	
	1.2 Vision of Senior Executive Management (SEM)	
	1.3 Definition and realization of operational processes structure	
	1.4 Identification of operational objectives and roles	
	1.5 Establishment of these entities process	
	1.6 Identification and presentation of Collaborative business relationships	
	1.7 Development of requirements for business	
	1.8 Initial risk assessment	
	1.9 Establishment of the RMP (Relationship Management Plan)	
2	Knowledge	
	2.1 Overall	
	2.2 Identify and maintain core	
	2.3 Identification of key individual's competence and behavior	
	2.4 Knowledge management	
	2.5 Supply chain and extended enterprise risks and opportunities	
	2.6 Identification of risk management process	
	2.7 Evaluation of the business case	
	2.8 Incorporation of knowledge into the RMP	
	2.9	
3	Internal Assessment	
	3.1 Overall	
	3.2 Identify and assess areas for collaboration	
	3.3 Assessment of collaborative profile	
	3.4 Assessment of collaborative profile	
	3.5 Assessment of collaborative relationships	
	3.6 Definition of partner selection criteria	
	3.7 Implementation of the RMP	
	3.8	
	3.9	
4	Partner Selection	
	4.1 Overall	
	4.2 Identification of potential collaborative partners	
	4.3 Partner selection and selection	
	4.4 Development of engagement and negotiation strategy for collaboration	
	4.5 Joint engagement and process process	
	4.6 Assessment of joint objectives	
	4.7 Assessment of joint objectives	
	4.8 Definition of joint objectives	
	4.9 Definition of joint objectives	
5	Building a Joint RMP	
	5.1 Overall	
	5.2 Establishment of the joint process structure	
	5.3 Joint technical management process	
	5.4	
	5.5	
	5.6	
	5.7	
	5.8	
	5.9	
6	Value Creation	
	6.1 Overall	
	6.2 Establishment of the value creation process	
	6.3 Identification of improvement and setting of targets	
	6.4 Use of learning from experience	
	6.5 Updating of the joint RMP	
	6.6	
	6.7	
	6.8	
	6.9	
7	Review Together	
	7.1 Overall	
	7.2 Oversight by the SEM	
	7.3 Management of the joint relationship	
	7.4 Implementation of monitoring of behavior and trust indicators	
	7.5 Cultural value creation	
	7.6 Delivery of joint objectives	
	7.7 Metrics of results	
	7.8 Issue resolution	
	7.9 Measurement of the joint exit strategy	
7.10 Maintenance of the joint RMP		
8	Risk Strategy Activation	
	8.1 Overall	
	8.2 Initiation of management	
	8.3 Business continuity	
	8.4 Evaluation of the relationship	
	8.5 Issue resolution	
8.6 Review and update of the RMP		

A&D PLM Global Collaboration Guidelines

A&D Collaboration Guidelines

- 1a. Prepare Recommended Collaboration for the Data Exchange Process
- 1b. Assess Supplier Capabilities (4)
- 2. Commercial, Contractual and Legal Relationship
- 3. Set up Governance (5)
- 4. Project management (1)
- 5. Set up Interfaces & organization (3)
- 6. Setup Collaboration Environment for Program Life
- 7. Program Review Process
- 8. End State (8) LoTAR

Done in parallel and can be done multiple times

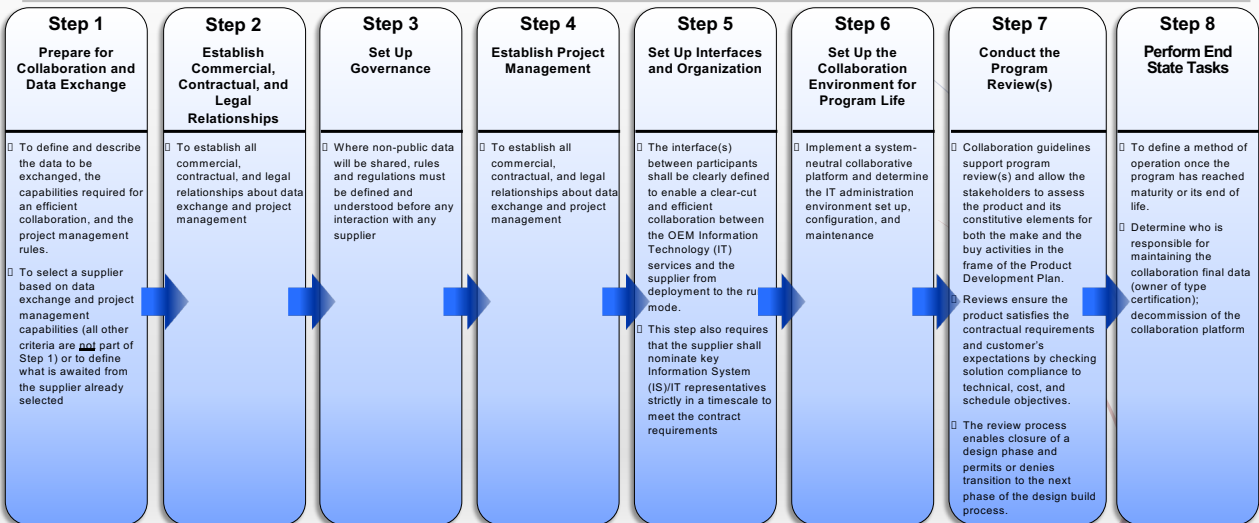
Objectives

- To optimize Collaboration supporting aerospace the A&D team developed and defined Aerospace Collaboration guidelines in Edition 2 paper
- These Guidelines evolved into a checklist which has been digitized into a web application Collaboration Management System (CMS)

Appendix: A Collaboration Guidelines Checklist

Item	Description	Status
1	Prepare for Collaboration and Data Exchange	
1.1	Define Type and Scope of Engineering Data	
1.2	Define recommended way of Collaboration	
1.3	Define recommended Project Management Terms and Tool	
1.4	Define IP Compliant Process	
1.5	Assess Collaboration Capability	
1.6	Supplier Selection Assessment	
1.7	Data Collaboration Agreement	
1.8	Audit and Follow up	
2	Commercial, Contractual, and Legal Relationship	
2.1	Define Data Exchange Rules and Processes	
2.2	Define Project Management Terms	
2.3	Monitor and Manage contract Execution and Contractual Coverage of Evolution Requests	
2.4	Anticipate and Mitigate Contractual Risks	
2.5	Amend Contract	
2.6	Manage Contract Entry, Close, and Terminate Contract	
3	Set up Governance	
3.1	Import/Export	
3.2	Intellectual Properties	
3.3	Security Considerations	
3.4	Personal Identifiable Information	
4	Project Management	
4.1	Supply Chain Management	
4.2	Authority Delegation	
4.3	Planning and Measurement	
4.4	Risk Analysis	
5	Set up Interfaces & Organization	
5.1	Nominate Focal Points	
5.2	Provide Access	
5.3	Define Support System	
6	Set up Collaboration Environment for Program Life	
6.1	Integration	
6.2	Initialization	
6.3	Operations	
7	Program Review Process	
7.1	Prepare the Review	
7.2	Conduct the Program Review	
7.3	Follow up and close the Product Review	
8	End State	
8.1	Review Data for Archiving	
8.2	Archive Data	
8.3	Decommission Collaboration Platform	

A&D PLM Global Collaboration - Guidelines



The Collaboration Standard Methods – Example Step 4

Step 4
Establish Project Management

Step 4. Establish Project Management

Purpose: Establish a common means of collaborating and managing the engineering activity, including scheduling of activities, delivery, and performance measurement

Prerequisites:

- Type of contract has been determined (see Step 2)
- Contractual agreements include what types of data are exchanged, delivery dates, and costs
- Statement of Work is the technical work description

4.1 Supply Chain Management

A dedicated organization shall be put in place by Tier 1 for Tier 2 management with specific resources as applicable; the organization will:

- Manage the flow down of OEM requirements
- Deploy all applicable tools, methods, and training
- Commit to controlling and securing quality, on-time delivery of deliverables
- Demonstrate capabilities and practices for adequate control and management of deliverables

4.2 Authority Delegation

- Determine what tasks are to be performed
- Delegate those tasks as applicable

4.3 Planning and Measuring

- Provide reporting of deliverable progress (metrics)
- Define the term *late* (how does the OEM determine when items are late?)
- Plan for end-of-life of the program collaboration (see Step 8)

4.4 Risk Analysis

- Determine and mitigate any risks

A&D PLM Global Collaboration – Application

The screenshots illustrate the Collaboration Management System interface. The first screenshot shows the main dashboard with a search bar and a table of collaborations. The second screenshot shows a project overview for 'A&D tool changes collab' with a progress bar and a table of tasks. The third screenshot shows a detailed view of 'Stage 1: Prepare for Collaboration and Data Exchange' with a description and a table of tasks.

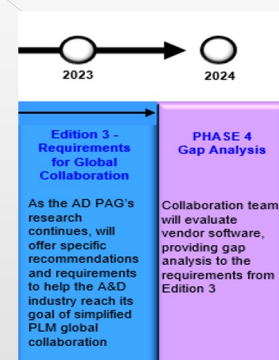
Images courtesy of Talisen Technologies

A&D PLM Global Collaboration – App and Documentation

- A&D Collaboration team worked with 3rd party (Talisen Technologies) to build the CMS Application to facilitate digital collaboration
- CMS Provides an optimized solution for how OEM/Supplier collaborations can be managed
- CMS Manages the 8 Step collaboration guidelines as a digital solution
- The CMS application is an open service solution supporting A&D Collaboration team strategy for digital collaboration industry engagement in a free cloud-based service via Talisen or an on-site solution with software licensing
- Requests from other software providers for Collaboration specifications and/or applications are welcome

Summary & Next Steps

1. CMS Document & Application
 - Target release Q3 2022
2. A&D PAG – SW Provider Requirements for Global Collaboration
 - Target release 2023
3. Following up with a GAP Analysis
 - Target release 2025



Come visit us at the A&D PLM Action Group Booth in the Exhibition