Global Collaboration Standards

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Presenters Bio

Ansel Koehler
Supplied Parts Capabilities and Solution Development
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Ansel has 9 years at the Boeing company with experiences from Supply Chain, IT Management, and Systems Engineering, to now more specifically manage the BCA Supplied Parts processes, data and tool development in Core Engineering.

He represents Boeing as part of the A&D PLM Collaboration Team where he is also responsible for helping lead and deploy Global Collaboration Business Process and Tool Strategies.

Presenters Bio

Neil Lichty
Digital Enterprise Capabilities Specialist

Email: Neil.K.Lichty@Boeing.com

Neil is a Subject Matter Expert at Boeing in Business Capabilities core project engineering.

He is responsible for Global Collaboration Business Process and Tool Strategies, where he influences new and emerging technologies.

He represents Boeing as a PLM specialist, where he drives collaboration strategies, exchange standards and enables Model Based Engineering across engineering products.

He is a specialist in operationalizing the product data digital thread and establishing interoperability across company and industry organizations.

Neil has 33 years of experience in the Aerospace industry and has 22 years of focused knowledge in the area of Capabilities Process and Tools development.

Mission

An association of aerospace & defense companies within CIMdata's globally recognized PLM Community Program, which functions as a *PLM advocacy group* 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

Project Lead: Robert Gutwein, Pratt & Whitney Canada

Project Specialist: Ansel Koehler, Neil Lichty, The Boeing Company

CIMdata Team Coordinator: Ken Versprille, CIMdata

Website: https://www.cimdata.com/en/aerospace-and-defense/initiatives/cms

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.**

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.

- 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**.

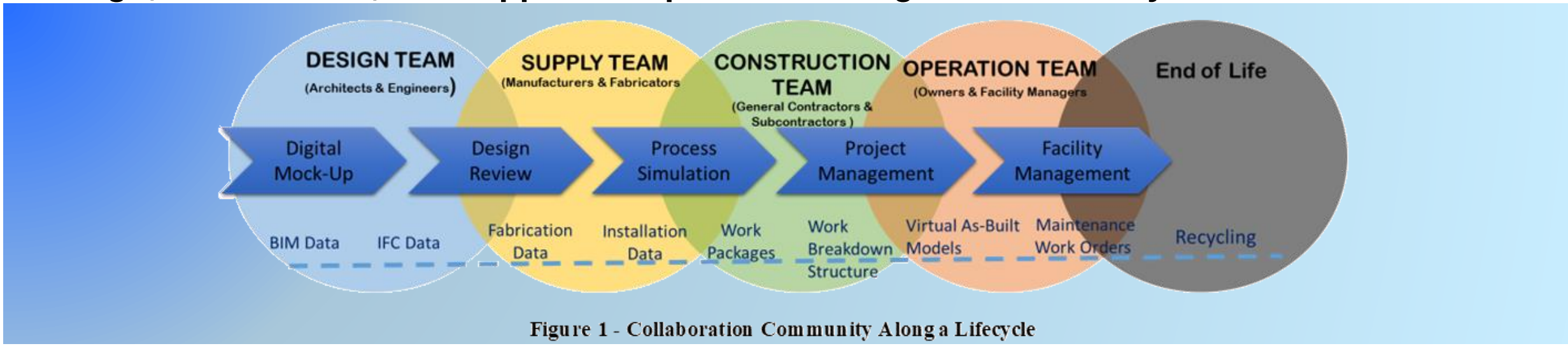


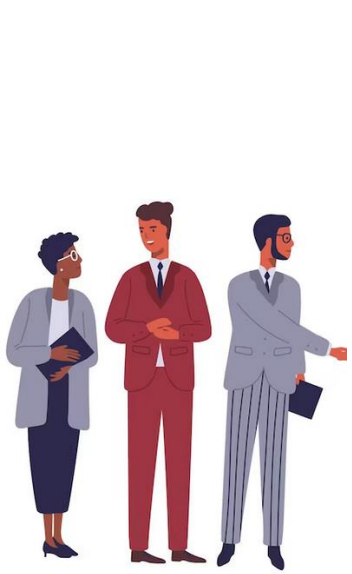
Figure 1 - Collaboration Community Along a Lifecycle

- 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.

A&D PLM Global Collaboration – Problem Statement

- 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.
  - Supplier contracts have enhanced to include data and models (from just paper based SOW agreements), which are constantly changing
  - Supplier contracts have to evolved as technology evolves within the life of a contract
  - Restarting collaboration projects from scratch is time consuming
- 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.

Pain Points in Traditional SOW Collaboration



Traditional SOW Agreement

- Lack of Data Exchange Standards
- Missed Project Artifacts
- Potential Export Regulation Issues
- IP Data Loss
- Time to Repeat Process
- Delays in Data Exchange of Product and Program

A&D PLM Global Collaboration

Evolution

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

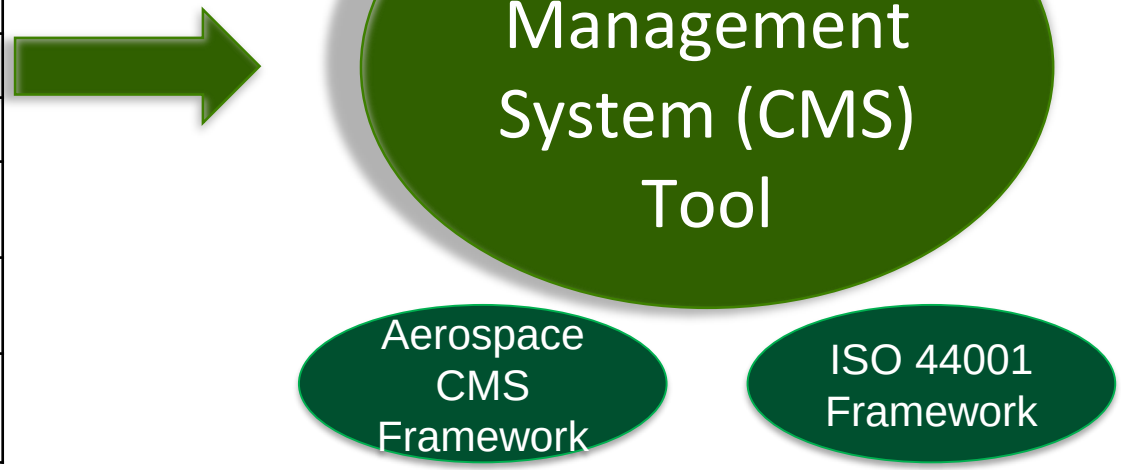
ELECTRONIC DEFINITION of product disrupted decades of industry standard practice with data transfer

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

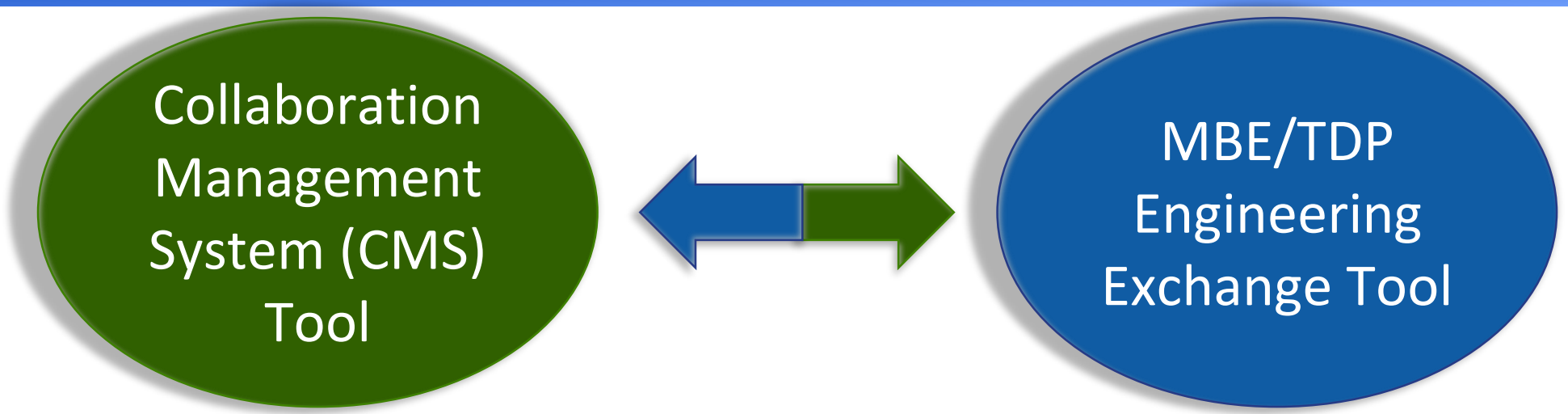
COLLABORATION IS NEEDED during all phases of program lifecycle. Levels of frequency and volumes will vary at each phase, which will determine the level of interconnectivity and interoperability.

Evolution

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



CMS vs MBE/TDP Tool



- Type and Scope of Data
- Commercial, Contractual, Legal Relationships
- Contract Execution and Evolution
- IP Management
- Security Protocols
- Project Management
- Program Review
- Data Archival

- Design Requirements
- Models
- Supporting Tech Data

A&D Collaboration Guidelines

1a. Prepare Recommended Collaboration for the Data Exchange Process

1b Assess Supplier Capabilities (4)

2. Commercial, Contractual and Legal Relationship

Done in parallel and can be done multiple times

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

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: A&D Collaboration Guidelines Checklist

Step	Global Collaboration Team Guidelines for A&D	Status
1	**Prepare for Collaboration and Data Exchange**	
1.1	Activate Non-Disclosure or Confidentiality Agreements (read in involved)	
1.2	Define Type and Scope of Data	
1.3	Define Recommended Way of Collaboration	
1.4	Define Recommended Project Management Terminology and Tool Set	
1.5	Define IP-Compliant Process	
1.6	Assess Collaboration Capability	
1.7	Supplier Selection Announced	
1.8	Data Collaboration Agreement	
1.9	Audit and Follow-Up	
2	**Establish Commercial, Contractual, and Legal Relationships**	
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	
2.4	Anticipate and Mitigate Contractual Risks	
2.5	Amend the Contract	
3	**Set Up Governance**	
3.1	Establish Import/Export Guidelines	
3.2	Determine Intellectual Property (IP)	
3.3	Implement Security Protocol(s)	
3.4	Protect Personal Identifiable Information	
3.5	Conduct Collaboration Platform Review(s)	
4	**Establish Project Management**	
4.1	Supply Chain Management	
4.2	Authority Delegation	
4.3	Planning and Measuring	
4.4	Risk Analysis	
5	**Set Up Interfaces and Organization**	
5.1	Nominate Focal Points	
5.2	Provide Access	
5.3	Define a Support System	
6	**Set Up Collaboration Environment for Program Life**	
6.1	Preparation	
6.2	Initialization	
6.3	Operation	
7	**Conduct the Program Review(s)**	
7.1	Prepare the Optimized Program Review	
7.2	Conduct the Program Review	
7.3	Follow Up and Close the Program Review	
8	**Perform End State Tasks**	
8.1	Review Data for Archiving	
8.2	Archive the Data	
8.3	Decommission the Program/Project Collaboration Space	
8.4	Manage the Contract Expiration and Close and Terminate the Contract	

A&D PLM Global Collaboration - Guidelines

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

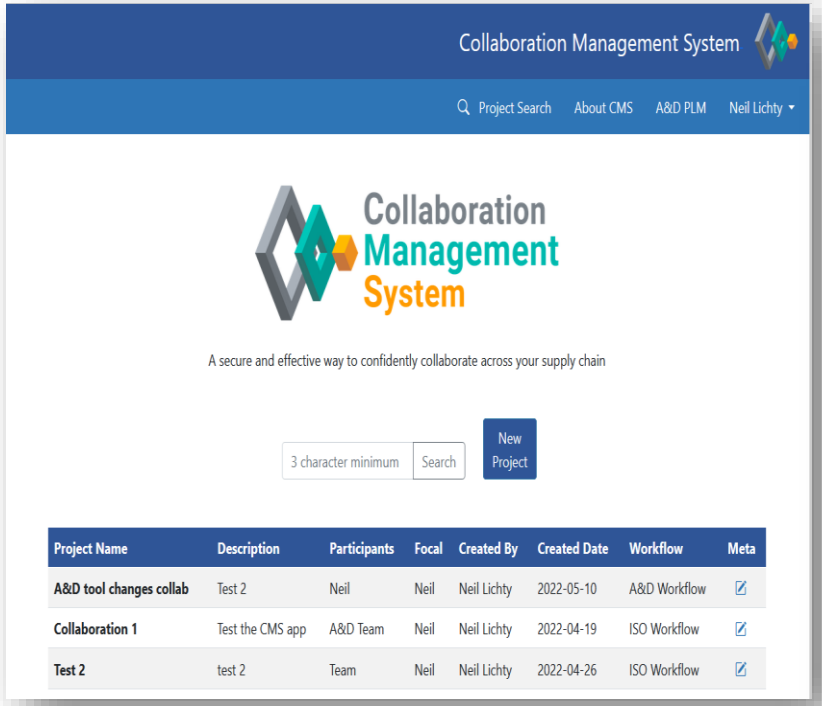
4.3 Planning and Measuring

- 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)

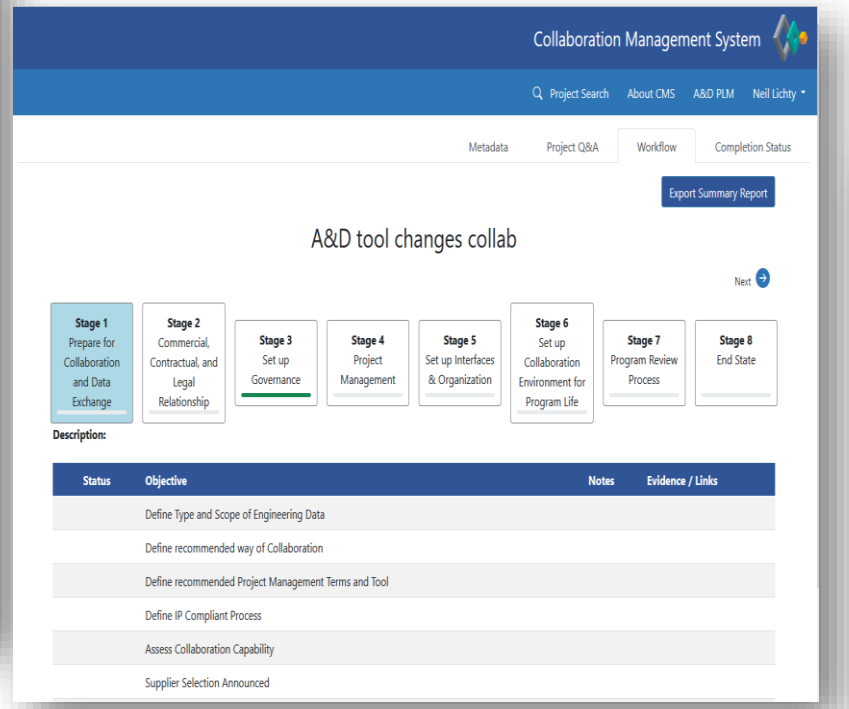
4.4 Risk Analysis

- Determine and mitigate any risks

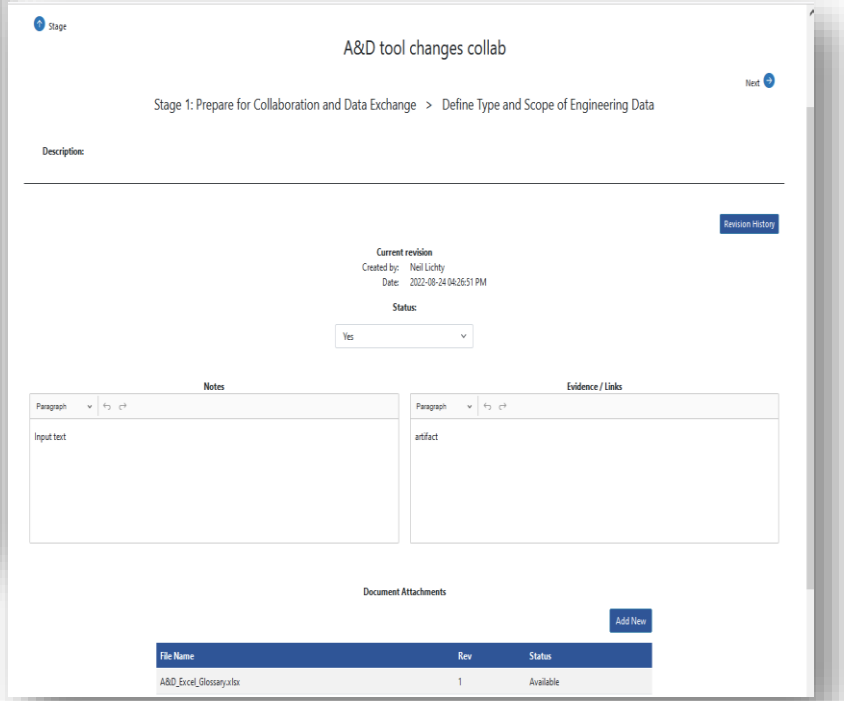
A&D PLM Global Collaboration – Application



Project work queue
(initial window upon login)



Collaboration status view showing progression of project stages



Individual collaboration objectives showing evaluation details including notes, deliverables and attachments

Images courtesy of Talisen Technologies

A&D PLM Global Collaboration – Application

Collaboration Test 1

Next

Stage 1 Prepare for Collaboration and Data Exchange

Stage 2 Establish Commercial, Contractual, and Legal Relationships

Stage 3 Set Up Governance

Stage 4 Establish Project Management

Stage 5 Set Up Interfaces and Organization

Stage 6 Set Up the Collaboration Environment for Program Life

Stage 7 Conduct the Program Review(s)

Stage 8 Perform End State Tasks

Description:

Purpose: To define and describe the data to be exchanged, the capabilities required for an efficient collaboration, and the project management rules. To select a supplier based on data exchange and project management capabilities (all other criteria are not part of Step 1) or to define what is awaited from the supplier already selected.

Prerequisites:

- Applicable regulations are identified, supporting the project (consider worldwide business relationships, governments, and regional authorities)
- Statement of Work has been defined (work scope defines category of supplier relationship, such as design and build to spec, design or other intellectual services, equipment)
- Export control and Intellectual Property (IP) agreement concerns are part of Step 3, and export control rules are not to be discussed but only observed
- Conditions to select a supplier are known

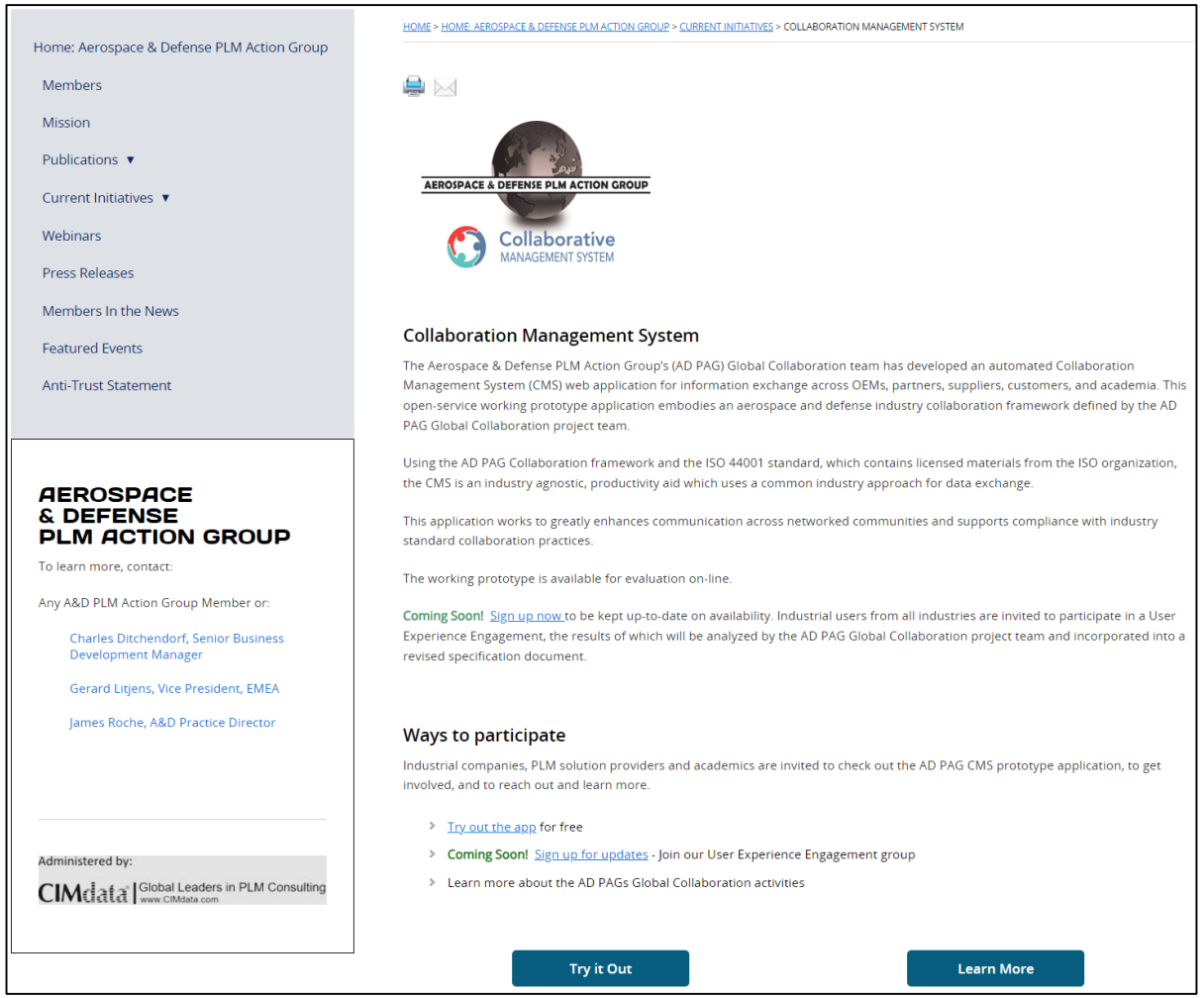
Status	Objective	Notes	Evidence / Links
Complete	Define Type and Scope of Data	to build a flying bicycle	
Complete	Define Recommended Way of Collaboration	bi-weekly meetings for 1 hour	
Complete	Define Recommended Project Management Terminology and Tool Set	MS Azure	

CMS Video

A&D PLM Global Collaboration

Collaboration Management System (CMS)

Global Product Data Interoperability Summit | **2023**



Home page: https://www.cimdata.com/en/aerospace-and-defense/initiatives/cms

Ways to participate

Industrial companies, PLM solution providers and academics are invited to check out the AD PAG CMS prototype application, to get involved, and to reach out and learn more.

- Try out the app for free
- **Coming Soon!** Sign up for updates - Join our User Experience Engagement group
- Learn more about the AD PAGs Global Collaboration activities

Try it Out ↓ User Engagement

Learn More ↓ Proposition Papers

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