Aerospace and Automotive Cooperation for practical MBSE Standards

Kenny Swope
Steven Vettermann
Bernd Feldvoss
Bibliographies

Bernd Feldvoss
Technology Specialist PLM Data Exchange, AIRBUS
Based in Hamburg, Germany
Joined Airbus in 1998
Since November 2011 Speaker of prostep ivip
Technical Steering Committee

Kenny Swope
Senior Manager, Boeing

Steven Vettermann
prostep ivip Manager Openness & Japan
PROSTEP Cluster Lead Systems Engineering
Based in Hamburg, Germany
Joined PROSTEP in 2004
Until 2017: General Manager prostep ivip
PhD in IT-Security in PLM
Role of MBSE for Airbus

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**Development milestones**

- MG3
- MG4
- MG5
- MG7
- MG8
- MG9
- MG11
- MG12
- MG13

**Architecture Trade-offs**
(performance, weight, RC...)

**Program monitoring**
(coverage, maturity...)

**Design validation**
(safety, shared resources...)

**Customer needs and value**

**Aircraft**

**Multi-systems**

**System**

**Equipment**

**Software/Hardware**

**Transverse design**

**Enablers**

**Program monitoring**
(coverage, maturity...)

**Control and validation**

design validation

**Software loadings**
(IMA, ADCN, Displays)

**Electrical Harness**

**Simulation means**

**Test means**

**Installation and Manufacturing**

**Integration**

**Certification**

**Aircraft**

**Delivered product**
Role of MBSE for Boeing

Boeing SE Statement: Business motivation & benefits
prostep ivip: Realizing Digitalization

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Enabling Digital Transformation based on Standards

- Engineering IT Standards for Product Properties
- Manufacturing Standards for Structure Plants, Control Logic & Shop Floor
- General IT Standards for Safety, Interoperability & Communication
Recap of 2018th Presentation

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Conclusion & Future Vision

- Vision for MBSE collaboration enabled by open standards

Cross Domain Collaboration
- Deep collaboration across Mechanics, Hardware and Software Design

Vertical Model Granularity
- From Requirements to Model to Function

Digital Verification / Integration
- Verification for sub-system, system and product

- Industrial Cooperation is required to reach alignment

- Cooperation prostep ivip / A&D PLM Action Group on MBSE is starting
Minimum Digital Thread for MBSE - based on Standards

Example topic areas to inform the modeling
Building the Digital Thread

Mastering System Configuration / Safety / Verification & Validation
Joining Forces: Kickoff 10/2018
Cooperation: prostep ivip / A&D PLM Action Group

Motivation:
• Aerospace - Unifying technical design requirements with physical architectures and behavior models, enable validation and verification.
• Automotive – Reducing cost pressures associated physical testing, prepare for significant growth in regulations for autonomous vehicles.

Mission:
• Create a road map for merging the complementary points of view
• Use a minimum viable product approach
• Focus on standards, processes, requirements
• Implementation best practices
• Ease IT vendor’s life, by providing cross-branch requirements
The MoU, signed by CIMdata President Peter Bilello and prostep ivip CEO Armin I bundle know-how in the collaboration of Industrial customers from the aerospace industries, especially in the area of Model Based System Engineering (MBSE).

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.

CIMdata has assembled a group of leading aerospace and defense companies into an action group to help address PLM-related challenges in that industry. CIMdata’s Aerospace & Defense PLM Action Group (A&D PAG) provides a unique opportunity for Aerospace & Defense Industry leaders to maximize the benefits they receive from their Product Lifecycle Management (PLM) investments. The A&D PAG is an association of major aerospace and defense OEMs and aircraft engine providers.

**Workgroups:**
- Obsolescence
- Multi View BOM
- Standards
- Global Collaboration

1. Company-specific Key Topics
   - Area of focus
   - Opportunity for improvement
   - MBSE concepts

2. Common Interests
   - Grouped into the V

3. Epics & User Stories
   - Outcome focused
   - Actor oriented
Derived Epics & User Stories

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- **Single Thread of the Data with Tools**
  - Requirements - Verification

- **Configuration Management of models**
  - Business Process Design & Efficiency
  - Regulatory Integration
  - Design Control of the Baseline
  - Manage Reuse

- **Data model interoperability between realization technologies**
  - Merge & Interaction of Data
  - Realization Technologies
  - Traceability
Next Step: Driving IT - Cornerstones

**Defining Measures:**
- Concrete Aims & KPIs
- Scenario, incl. data/info/models/standards
- Participants
- Timelines
- Deliverables
## Next Step: Driving IT - Responsibilities

<table>
<thead>
<tr>
<th>User Group</th>
<th>Show Casing</th>
<th>Implementor Forum</th>
<th>Benchmark</th>
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<tbody>
<tr>
<td>Gather Scenarios, Use Cases, Standards, Best Practices, Requirements</td>
<td>IT Vendors demonstrate how they support scenarios - in real environments</td>
<td>IT vendors address user requirements and realize interoperability, self-governed</td>
<td>User-defined tests, accepted by vendors, conducted by neutral instance</td>
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→ Guidelines | → Experiences | → Mission-completed statements | → Test Reports
Conclusion & Future Vision
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Accomplished:
• Collaboration Aero/Auto established (Memorandum of Understanding: prostep + impi + CIMdata)
• Kickoff: Relevant Epics & User Stories defined

Next Steps:
• Publishing Guidelines for practical MBSE
• Driving IT Interoperability based on Standards
  • Ease IT vendor’s life, by providing cross-branch requirements
  • Show Casing, guided by User Group
  • Preparing Interoperability/Implementor Forums (assuring quality interoperability)
Save the date
prostep ivip Symposium
12/13 May 2020
Stuttgart, Germany

https://www.prostep-ivip-symposium.org