

# Navigating the PLM Standards Universe

## CIMdata PLM Webinar Series

10 November 2016

#cimdatawebinar

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**CIMdata**<sup>®</sup>

Global Leaders in PLM Consulting  
[www.CIMdata.com](http://www.CIMdata.com)

# Presenters' Profile

*Chris Gregory*



- Chris Gregory, Practice Manager, PLM Success
  - Chris Gregory comes to CIMdata with over 30 years of experience with major PLM solution providers, with broad experience and cross functional roles in services, product marketing, sales support, strategic alliances, business development and program management
    - Chris has led PLM implementations collectively representing over 100,000 users, over \$250 million in proven ROI
    - Chris currently manages CIMdata relationships with the CIMdata PLM Community members

# CIMdata's Mission...

*Strategic management consulting for competitive advantage in global markets*

**CIMdata is the leading independent global strategic management consulting and research authority focused exclusively on the PLM market.**

**We are dedicated to maximizing our clients' ability to design and deliver innovative products and services through the application of PLM.**

# CIMdata's Mission...

*Our role in the PLM Economy for over 30 years*

***CIMdata is the leading independent global strategic management consulting and research authority focused exclusively on the PLM market.***



***We are dedicated to maximizing our clients' ability to design and deliver innovative products and services through the application of PLM.***

# PLM Standards Research

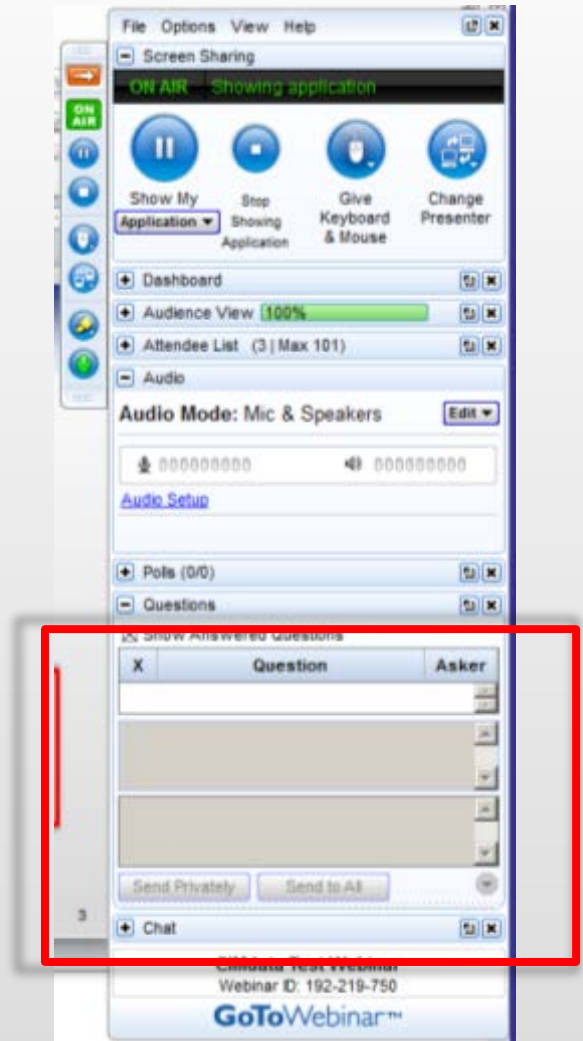
*Topics for today's webcast*

- Webinar Overview
- High Impact Standards Landscape
- Investment Strategies
- Individual PLM Standards Review

# Questions?

*Please use the GoToWebinar Question panel*

- Please enter questions in the GoToWebinar Question panel
- We will pause after major sections for questions and save 5 min at end, answer as many questions as time allows...
- Those that can't be answered live will be answered by email



# Learning Objectives

*What you should understand at the end of this session*

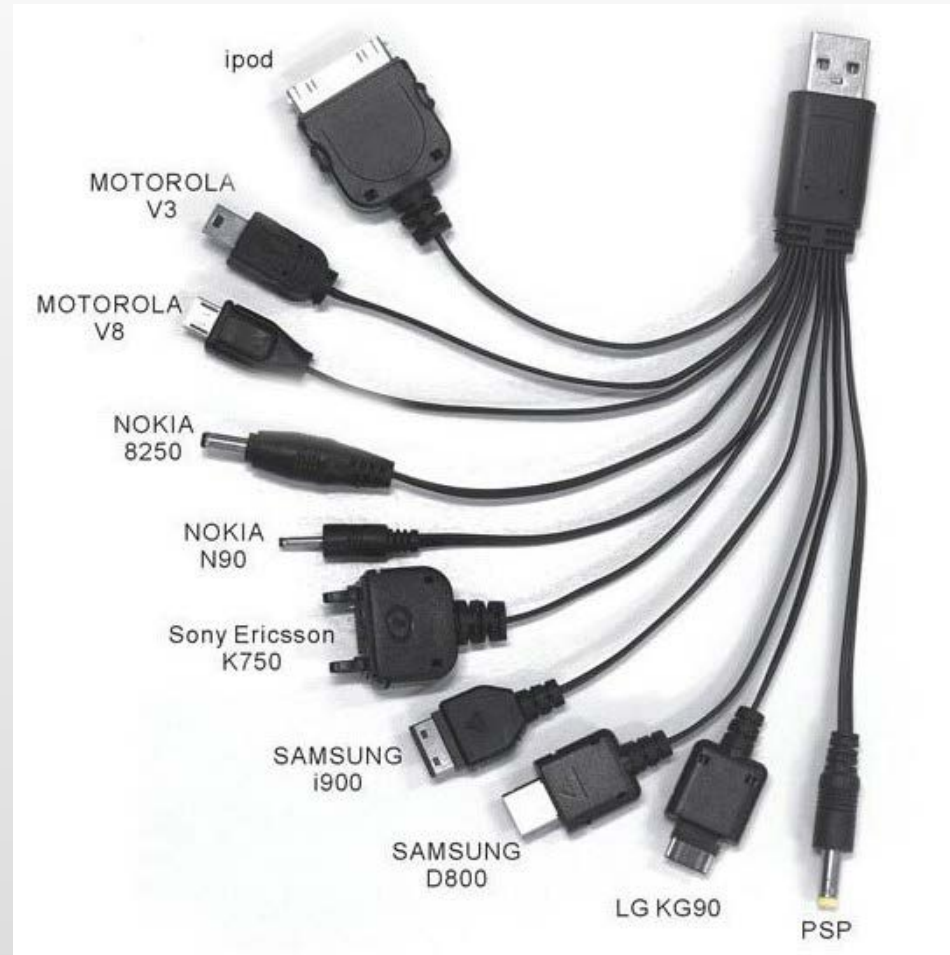
- Which PLM standards are important for your business
- Why PLM standards are needed
- Where the major PLM standards are headed



# Project Overview

*Remember being sold “Standard Cell phone” connectors?*

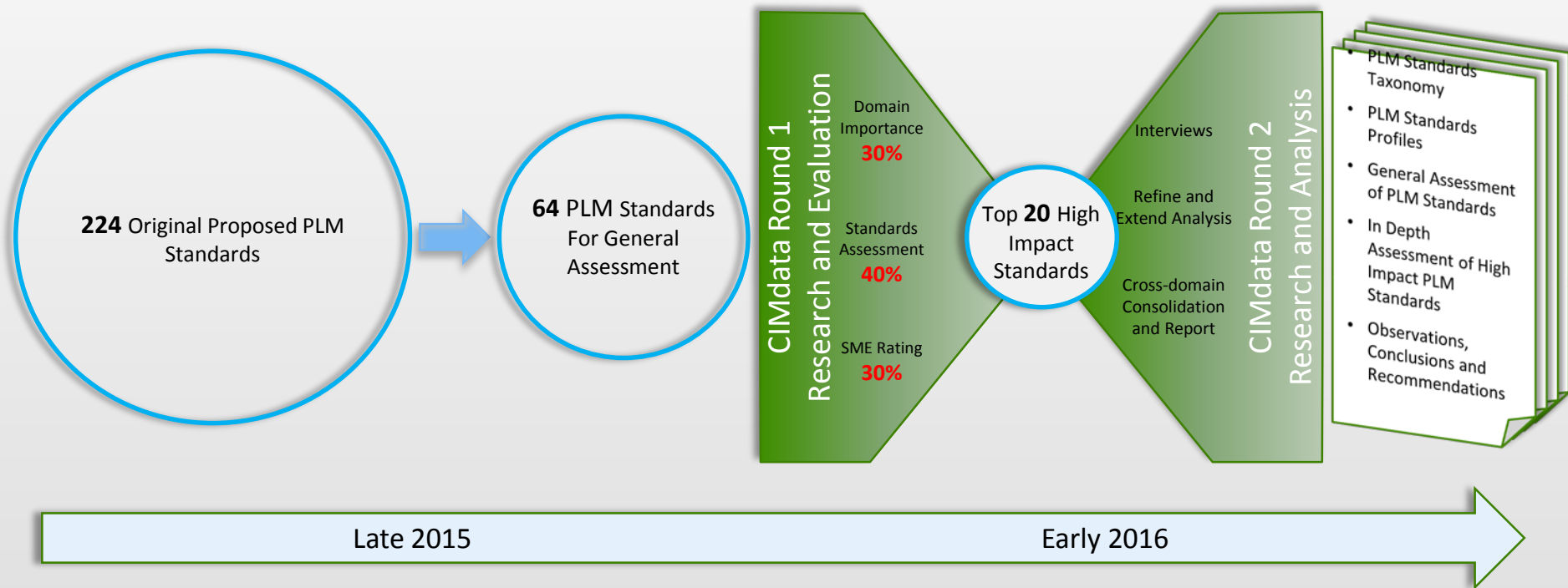
- Look all too familiar?





# Project Overview

Process – Narrow focus to set of **High Impact Standards**, then deep dive



# Round 1 Standards Evaluation Criteria

## *Standards Assessment - 40% (2 of 2)*

### Definitions of evaluation dimensions and assessment levels

**Maturity:** Completeness of scope

- 3 – Multiple releases over several years; all elements of scope addressed
- 2 – Substantial content in one or several releases
- 1 – Pre-release

**Adoption:** Extent to which standard is used within industry and available in commercial products

- 3 – Available in multiple commercial products and broadly (>50%) used within industry
- 2 – At least one complete commercial offering and substantial adoption (>10-20%) within industry
- 1 – Limited or no adoption within industry

**Customer Requirement:** Standard is a stated requirement in customer (e.g.. DoD or FAA) contract for deliverables format

- 3 – Comprehensive or mandatory
- 2 – Occasional or optional
- 1 – Not required

**Level of Backing:** Extent to which standards development and adoption is supported by industry and solution providers

- 3 – Broad and deep contribution of resources
- 2 – Moderate contribution of resources
- 1 – Nascent or orphan

**Rate of Progress:** Rate of standards development as evidenced by maturation and/or release schedule

- 3 – History of releases with major incremental content
- 2 – Moderate (i.e. average) release schedule and content
- 1 – Infrequent releases with modest content or finalized

# Round 2 Standards Evaluation Criteria

## *Definitions of evaluation dimensions and assessment levels*

**Degree of Openness:** Degree to which standard is available to the general public and its definition and maintenance is controlled by public consensus.

- 5 – Full open, published by internationally recognized standards body
- 2, 3, 4 – Increasing levels of openness
- 1 – Standard not yet published, or controlled by vendor

**Interchange verification:** Extent to which standard has been verified across platforms/applications. Possibly with standard schema

- 5 – Comprehensive collection of tools to verify input/output consistency
- 2, 3, 4 – Increasing levels of interchange verification
- 1 – No available tools

**Key Influencers:** Key standard committee members, and the industry and organizations that are represented

- 5 – Committee contains broadest range of key influencers, representing several organizations, each from several industries
- 2, 3, 4 – Increasing broad number and diversity of influencers
- 1 – Limited to one or two influencers, within one or two organizations

**Adoption by Industry:** Extent to which standard is used within industry

- 5 – Widespread adoption by multiple industries
- 2, 3, 4 – Increasing levels of adoption
- 1 – Limited or no adoption

**Adoption by Software Providers:** Extent to which standard is available in commercial PLM application products

- 5 – Widespread adoption by multiple COTS offering
- 2, 3, 4 – Increasing levels of adoption
- 1 – Limited or no adoption

**Adoption by Standards solution providers:** Extent to which standard implementation solutions are available from standards solution providers (ProSTEP, Theorem, International TecheGroup (ITI), Modelon, etc.)

- 5 – Widespread adoption by both standards providers and standard solution providers
- 2, 3, 4 – Increasing levels of adoption
- 1 – Limited or no adoption

**Collaboration between software providers and standards solution providers:** Extent to which PLM software providers collaborate with standards solution providers.

- 5 – High degree of collaboration – Excellent working relationship between parties
- 2, 3, 4 – Increasing levels of bi-lateral collaboration
- 1 - Limited or no collaboration – no solution providers cooperation or delayed availability

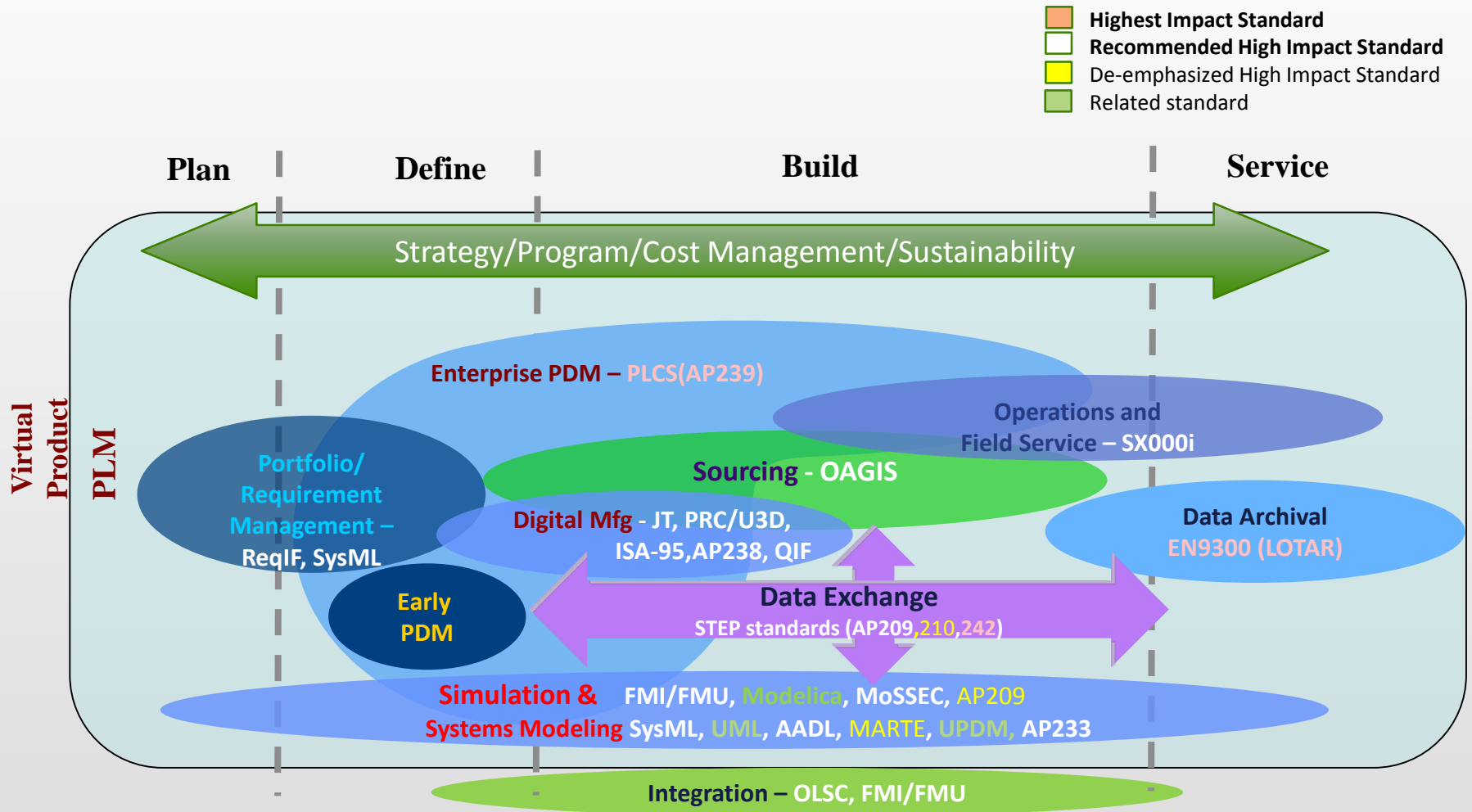
# PLM Standards Research

*Topics for today's webcast*

- Webinar Overview
- High Impact Standards Landscape
- Investment Strategies
- Individual PLM Standards Review

# High Impact Standards Landscape

*High impact standards mapped into the product lifecycle*



# Leading Providers for High Impact Standards

*Leading Solution Providers & Industrial Organizations working with each*

Domain	High Impact Standard	Leading Organizations		Comment
		Solution Providers	Industrial Firms	
MBSE	FMI/FMU	Numerous M&S software providers Siemens PLM (LMS), NoMagic, PTC (ATEGO) ignore CMU/SEI Dassault, Siemens PLM, MSC, Eurostep Jotne Siemens PLM, IBM Rational	Widespread automotive use Large A&D firms (Boeing, Airbus etc.), NASA/JPL	Early stage COTS productization
	SysML			
	MARTE			
	AADL			
	MoSSEC			
	ISO 10303 Part 209			
MBD	ISO 10303 Part 233	PLM providers are working on ed2 implem	Large A&D firms (Boeing, Airbus etc.)	ignore in favor of defacto industry stds.
	ISO 10303 Part 210			
	ISO 10303 Part 238			
Advanced Mfg & Robotics	ISO 10303 Part 242 ed1 & ed2			
	QIF	Siemens PLM	LM, Honeywell	
PLM Data	ReqIF	Siemens PLM, PTC, IBM Rational	German Automotive firms	Only in use with German Automakers
	VDA 4968 VEC KBL	ignore	ignore	
	OSLC	IBM, Siemens PLM, PTC, Aras	Numerous	
	PRC/U3D	Siemens PLM	Numerous	
	ISO 140306 JT V1&V2	Siemens PLM	Numerous	
	ISO 10303 Part 239 (PLCS)	Eurostep, PDES Inc.	Large A&D firms (Boeing, Airbus etc.)	
PLM Process Domain	EN9300-120 ed1 (LOTAR)	No COTS implementation	Large A&D firms (Boeing, Airbus etc.)	Draft standard, in development
Domain Edges	ISA-95 (MES)	stomized implementations by MES provide	Consumer Package Goods (CPG) - Mars, Nestle	Draft standard, in development
	OAGIS (ERP)	All major ERP providers, no PLM providers	Widespread industry A2A, B2B use	
	SX1000i (Logistics Support)	No COTS implementation	Widespread A&D industry backing	

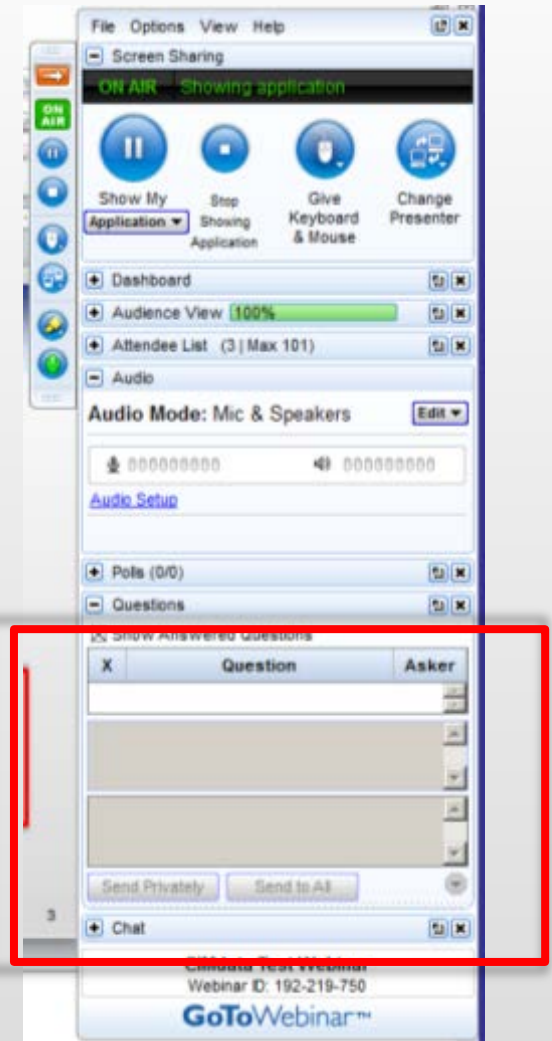
**NOTE:** Above list is **NOT exhaustive**, but highlighted from CIMdata research notes.

3 March 2016 - CIMdata Confidential

# Brief Pause for Questions....

*Two minute pause for questions before go on...*

- Those that can't be answered live will be answered by email







# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (1 of 6)*

## Product Domain (1 of 2)

Product Development Process		Product Technology				
		Mechanical	Electrical	Software	Mechatronics	
Model-Based Systems Engineering	Requirements Modeling & Traceability	SysML	SysML	SysML	SysML	
		AADL	AADL	AADL	AADL	
	Modeling & Simulation - Architectural (Functional, Logical)	SysML		AADL	SysML	
		AADL			AADL	
	Modeling & Simulation - Physical (0D, 1D)	FMI/FMU ISO 10303 AP242	FMI/FMU	FMI/FMU	FMI/FMU	
	Detailed Design					
	Model-Base Definition	Manufacturing Engineering	ISO 10303 AP242 182	ISO 10303 Part 210		
Component Verification & Validation						
Advanced Manufacturing & Robotics (AMR)	tbd	tbd	tbd			
Sub-system and System Verification and Validation	FMI/FMU			FMI/FMU		

-  - High
-  - Med High
-  - Medium
-  - Low

Domain importance determined by CIMdata expert consensus







# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (2 of 6)*

## Product Domain (2 of 2)

<b>Advanced Manufacturing &amp; Robotics (AMR)</b>		<b>Deployment</b>		Scheduled Maintenance	High
Process Planning	High	Deployment	High	Logistics Support	High
Production Assets	Low	<b>Training</b>		Provisioning	Med High
Work Instructions	Med High (QIF)	Technical Publications	High	Operational & Maintenance Feedback	High
Product Quality Metrics	Medium	Maintenance Procedures	High	Order Administration	Med High
<b>Sub-Systems &amp; System Verification &amp; Validation</b>		<b>Support</b>		<b>Disposal</b>	
Lab/Ground	Med High (EMI/EM U)	Technical Publications	High	Materials - Radiologicals	Medium
Field/Flight	High (EMI/EM U)	Maintenance Repair and Overhaul (MRO)	Med High		





-  - High
-  - Med High
-  - Medium
-  - Low

# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (3 of 6)*

## Product Domain (2 of 2)

<b>Advanced Manufacturing &amp; Robotics (AMR)</b>		<b>Deployment</b>		Scheduled Maintenance	High
Process Planning	High	Deployment	High	Logistics Support	High (SAP/PP)
Production Assets	Low	<b>Training</b>		Provisioning	Med High
Work Instructions	Med High (QIF)	Technical Publications	High	Operational & Maintenance Feedback	High
Product Quality Metrics	Medium	Maintenance Procedures	High	Order Administration	Med High
<b>Sub-Systems &amp; System Verification &amp; Validation</b>		<b>Support</b>		<b>Disposal</b>	
Lab/Ground	Med High (EMI/EM U)	Technical Publications	High	Materials - Radiologicals	Medium
Field/Flight	High (EMI/EM U)	Maintenance Repair and Overhaul (MRO)	Med High		

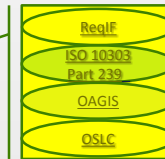
-  - High
-  - Med High
-  - Medium
-  - Low

# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (4 of 6)*

PLM Domain (1 of 2)

PLM Data	Product Technology			
	Mechanical	Electrical	Software	Mechatronics
Storage	Medium	Medium	Medium	Medium
Exchange	High ISO STEP AP242 ISO 15926 Part 239	Med High VDA 4968 VEC KBL	Medium	High ISO STEP AP242 182
Visualization	Med High PBCA130 ISO 14306 IT 101 & 2	Med High	Low	Med High
Delivery	Medium	Med High	Low	Medium
Retention (LOTAR)	Med High EN9300- 120 Ed2	Med High EN9300- 120 Ed2	Low	Med High EN9300- 120 Ed2
Configuration Management	High	High	High	High






- High
- Med High
- Medium
- Low

# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (5 of 6)*

## PLM Domain (2 of 2)

PLM Process		PLM Process	
Configuration Management	ISO 10303 Part 211	Simulation Process and Data Mgt (SPDM)	MoSSEC
Variance Management		Physical Test Data Management	MoSSEC
Configuration Status Accounting		Security & Access Control	
Change Management		Data Distribution	
Master Data Management (MDM)		Work Flow	
Application Lifecycle Mgt (ALM)		Analytics & Reporting	



-  - High
-  - Med High
-  - Medium
-  - Low

# High Impact Standards Landscape

*Mapped into the PLM standards taxonomy (6 of 6)*

**PLM Domain Edges**

Business Process		Business System	
Purchasing	Medium	CRM	Low
Planning	Med High	MRP	Med High
Accounting	Low	ERP	Med High <i>OAGIS</i>
Finance	Low	MES	High <i>ISA-95</i>
Quality	Medium		
Inventory	Medium		
Asset Management	Medium		

-  - High
-  - Med High
-  - Medium
-  - Low

# PLM Standards Research

*Topics for today's webcast*

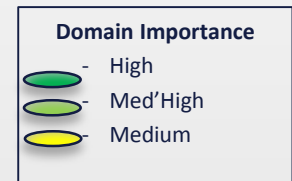
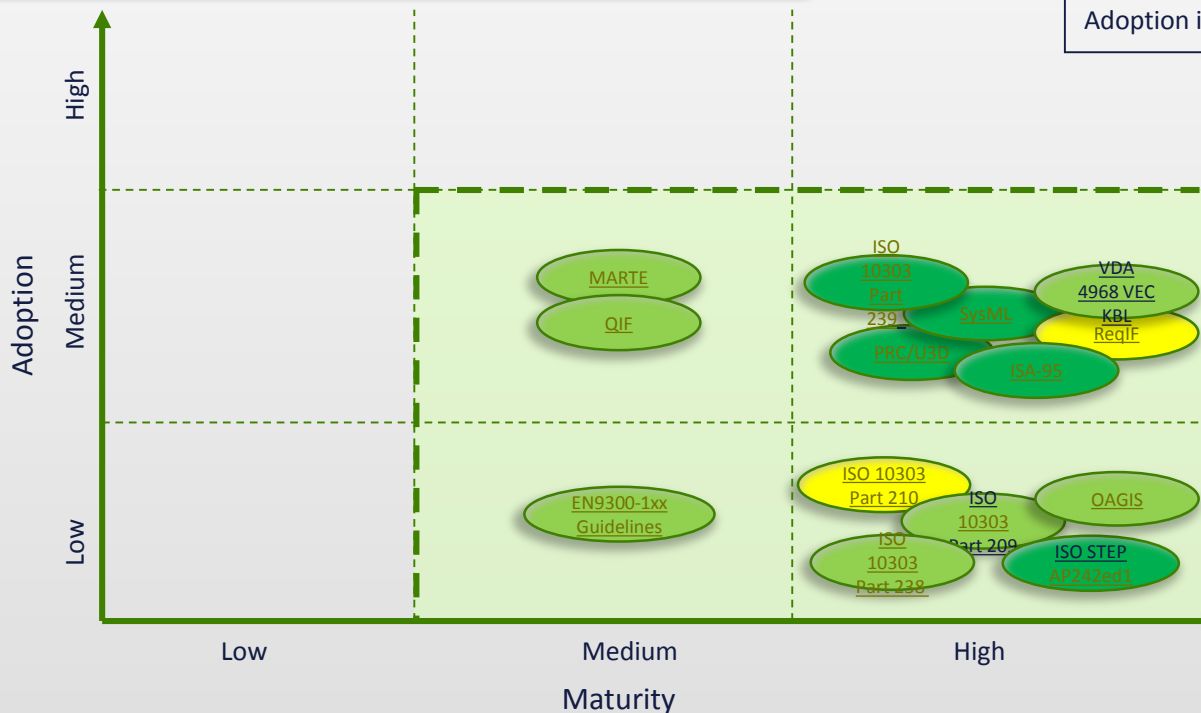
- Webinar Overview
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# Investment Strategy Maps

*Promote adoption of standards with high maturity and low adoption (1 of 5)*

General results, shown below, are based on analysis of Round 1 evaluation.  
Specific standard recommendations are indicated in standard summaries.

Domain importance is: Med - High  
Maturity is: Med - High  
Adoption is: Low - Med

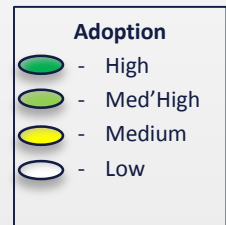
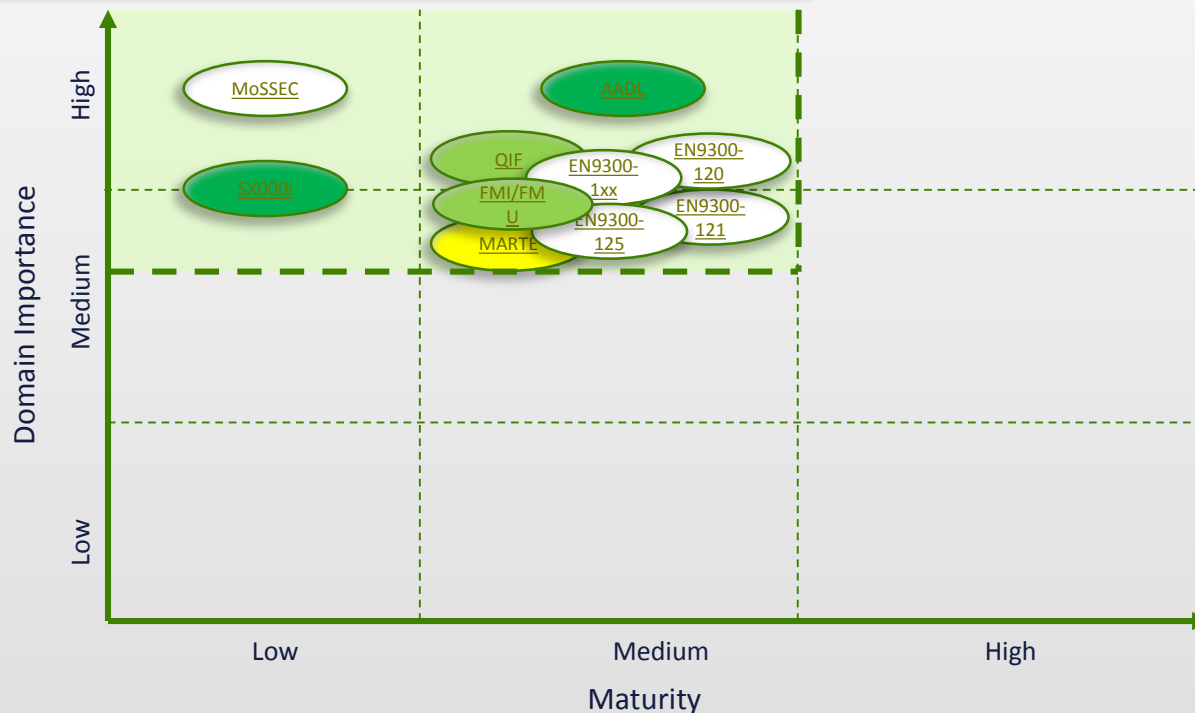


# Investment Strategy Maps

*Participate in dvlp. of standards with low maturity but high importance (2 of 2)*

General results, shown below, are based on analysis of Round 1 evaluation. Specific standard recommendations are indicated in standard summaries.

Domain Importance is: Med'High - High  
Maturity is: Low-Med



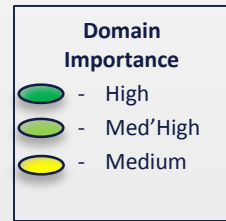
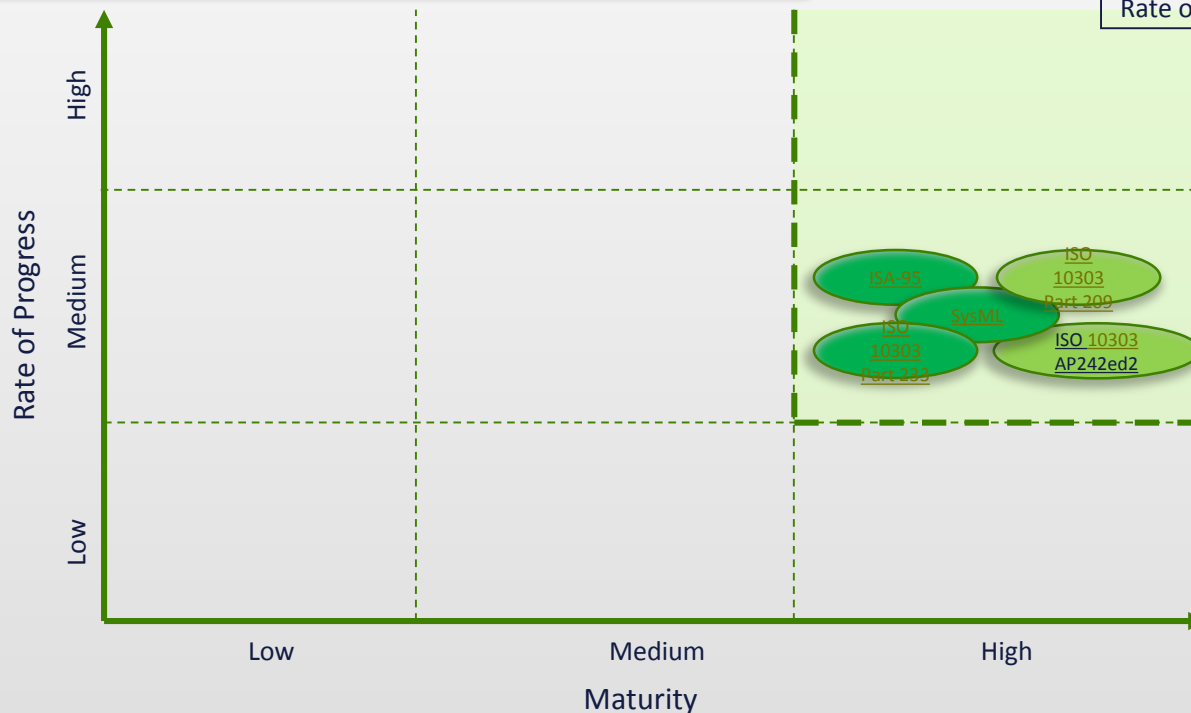


# Investment Strategy Maps

*Participate in dvlp. of standards w/high maturity but w/high rate of progress (3 of 5)*

General results, shown below, are based on analysis of Round 1 evaluation.  
Specific standard recommendations are indicated in standard summaries.

Domain Importance is: Med'High - High  
Maturity is: High  
Rate of Progress is: Med - High

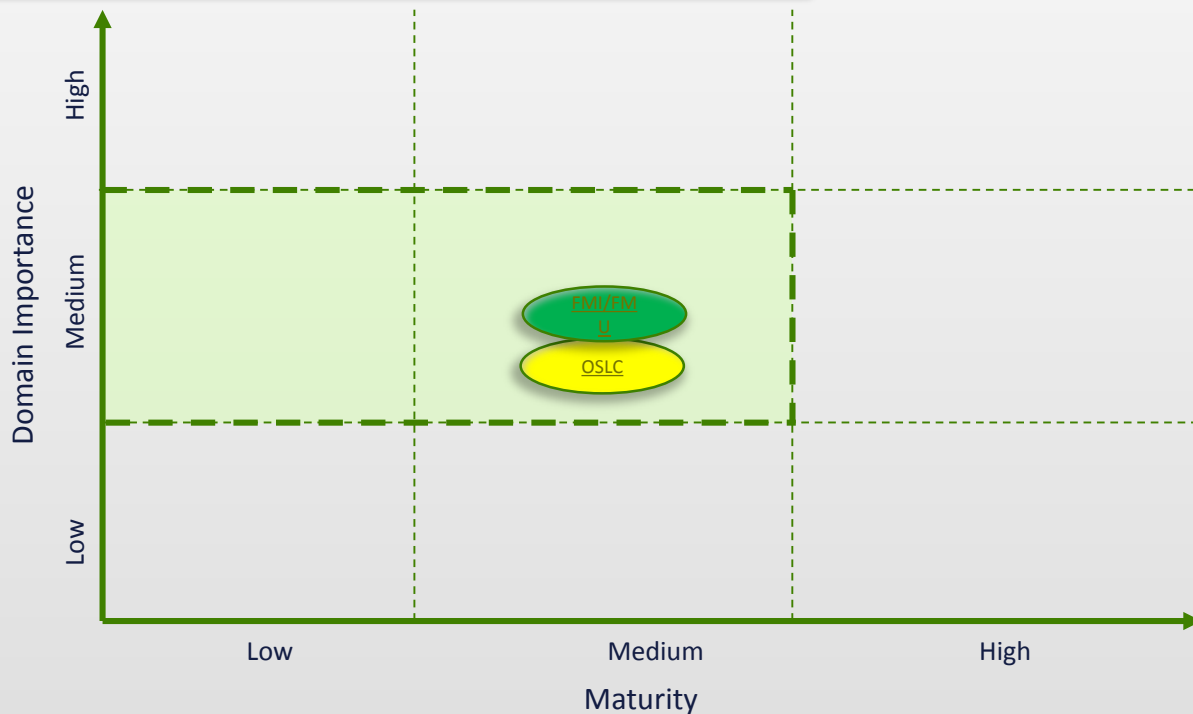


# Investment Strategy Maps

*Track dvlp. of standards of medium importance w/medium to low maturity (4 of 5)*

General results, shown below, are based on analysis of Round 1 evaluation.  
Specific standard recommendations are indicated in standard summaries.

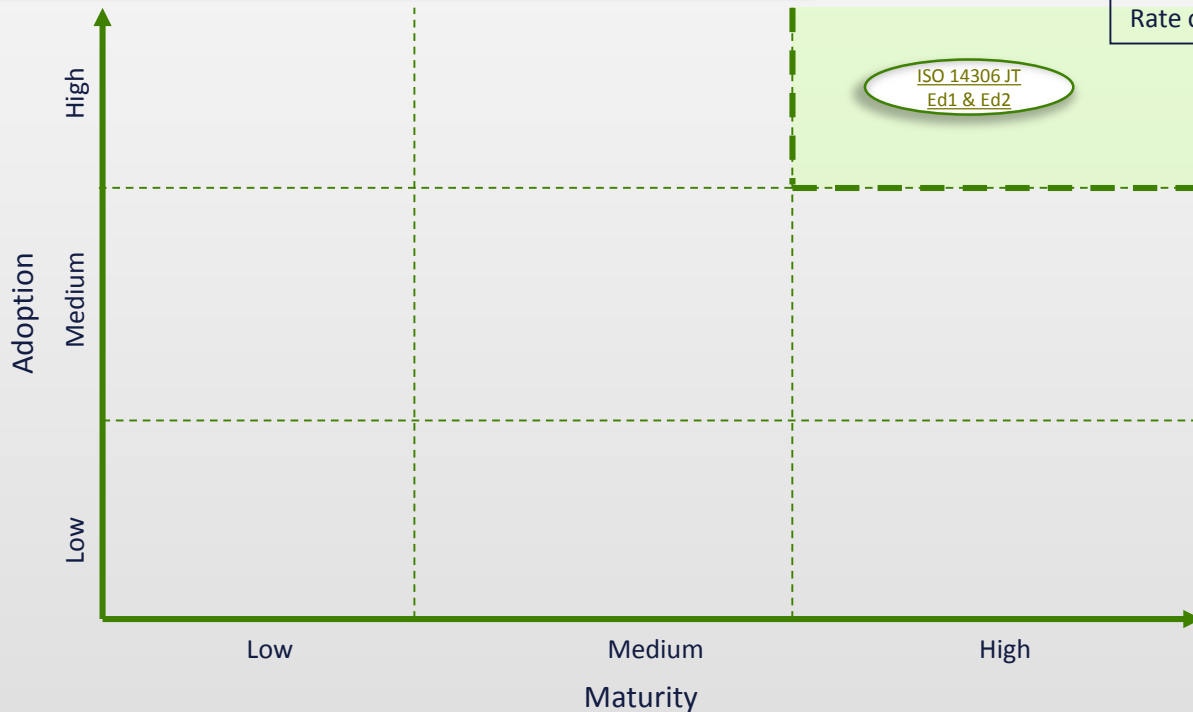
Domain importance is: Med  
Maturity is: Med - Low



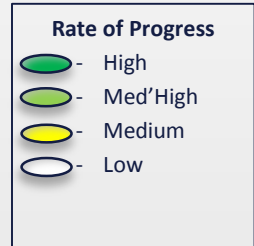
# Investment Strategy Maps

**No action on standards that have high maturity & high adoption – “oxygen” (5 of 5)**

General results, shown below, are based on analysis of Round 1 evaluation.  
Specific standard recommendations are indicated in standard summaries.



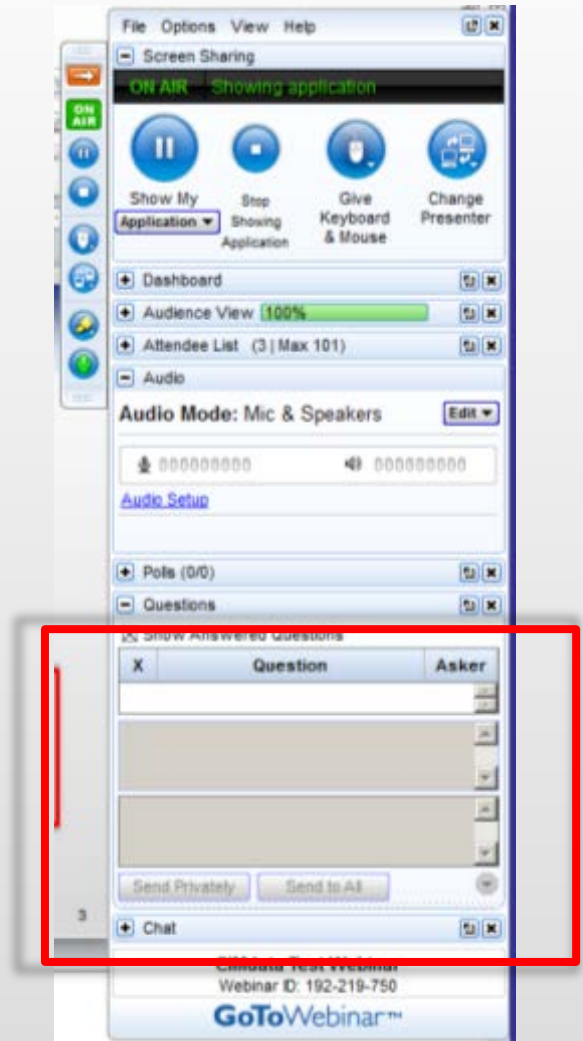
Maturity is:	High
Adoption is:	High
Rate of progress:	Low



# Brief Pause for Questions....

*Two minute pause for questions before go on...*

- Those that can't be answered live will be answered by email



# PLM Standards Research

*Topics for today's webcast*

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# High Impact PLM Standards

*One slide summary reference for each standard, structured by taxonomy*

- MBSE Domain
  - [FMI/FMU](#)
  - [SysML](#)
  - [MARTE](#)
  - [AADL](#)
  - [MoSSEC](#)
  - [ISO 10303 Part 209](#)
  - [ISO 10303 Part 233](#)
- MBD Domain
  - [ISO 10303 Part 210](#)
  - [ISO 10303 Part 238](#)
  - [ISO 10303 Part 242 ed1&2](#)
- Advanced Manufacturing & Robotics
  - [QIF](#)
- PLM Data Domain
  - [ReqIF](#)
  - [VDA 4968 VEC KBL](#)
  - [OSLC](#)
  - [PRC/U3D](#)
  - [ISO 14306 JT V1&V2](#)
  - [ISO 10303 Part 239 \(PLCS\)](#)
- PLM Process Domain
  - [EN9300-120 ed2 \(LOTAR\)](#)
- Domain Edges- Business Systems
  - [ISA-95](#) (MES)
  - [OAGIS 10](#) (ERP)
- Domain Edges - Logistics Support
  - [SX000i](#)

# ISO 10303 Part 242 ed1 & ed2

## Managed model-based 3D engineering

### ● Gaps and Overlaps

- Currently lacking mature COTS support, although improving

### ● Future Trends

- Part 242 ed2 being worked and projected for Sept 2017 ratification

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
3	1	2	2	2

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Open, ISO STEP framework</li> <li>• Mature; even after only 1 year since Part 242 includes Part 203 and Part 214</li> <li>• Extensive attention paid to MBD when ed1 defined</li> </ul>	<ul style="list-style-type: none"> <li>• Relatively new (ed1 dated 12/01/2014)</li> <li>• Limited COTS implementations</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Identify where currently using Part 203 / Part 214 and begin transition to Part 242</li> <li>• Work on ed2 to guide standard for wire harness, 3D printing support, and composites support</li> </ul>	<ul style="list-style-type: none"> <li>• Many use cases can be handled by lightweight 3D model formats (JT and 3D PDF)</li> <li>• Alternate wire harness standard in VDA 4968 strongly backed by automotive industry</li> </ul>

[Part 242 Standard](#)  
[STEP AP 242 Project Home Page](#)

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards solution providers	Collaboration between S/W and standards
5	5	4	4	3	5	5

# ISO 10303 Part 239

## Product Lifecycle Support (PLCS) with Data Exchange Specifications (DEXs)

### ● Gaps and Overlaps

- Is a broad integration model - deliberately overlaps with many standards
- Complements AP242 and others
- Overlap with OAGIS for supply chain requirements

### ● Future Trends

- PLCSlib – DEX documented with SysML/XML (EuroSTEP)
- Cloud PLM support for PLCS

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
3	2	3	2	1

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Open, ISO STEP framework</li> <li>• Mature, with first release in 2005</li> <li>• PLCS harmonizes data from requirements to support</li> <li>• Required by French, Swede, and Norwegian defense industries, and for all DoD product information delivery thru DLA SPOE.</li> </ul>	<ul style="list-style-type: none"> <li>• Cost/time of DEX creation inhibits widespread commercial adoption</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• PLCS support for OAGIS 10 for SCM</li> <li>• Creation of downloadable “PLCSlibs” will expand commercial adoption</li> </ul>	<ul style="list-style-type: none"> <li>• None forecasted</li> </ul>

[AIA Background](#) [Boeing/EuroSTEP PLCS Web Services](#)  
[DEX Overview](#)

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards solution providers	Collaboration between S/W and standards
5	3	4	3	2	2	1



# EN9300-1XX (120)

## LOTAR 3D CAD with PMI (graphics only)

### ● Gaps and Overlaps

- Pre-requisites are ISO 10303 Part 203, 214, 242
- Competition with JT and 3D PDF

### ● Future Trends

- Guided by ISO 10303 Part 242 definition
- Support for -121, -125

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
1	1	3	3	2

#### STRENGTHS

- Lotar International supported by AIA and ASD
- Based on ISO 10303 formats
- 120 ED1 released and in production use in multiple member companies

#### WEAKNESSES

- Only polyline portion currently published
- Unclear if any COTS implementations
- 120 only covers visualization, "semantic" or Machine Consumable 121e1 release planned 6/2016, 121e2 12/2017

#### OPPORTUNITIES

- Continue to work with LOTAR international, ProSTEP, ATA and ASD to influence and define the related standards

#### THREATS

- Semantic information exists in CAD, and is being used via direct access so standard adoption may be slowed
- Changes to definition

<http://www.lotar-international.org/lotar-workgroups/lotar-3d-cad-with-pmi.html>

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards Vendors	Collaboration between S/W and standards
5	5	4	2	3	4	5

# FMI/FMU

## Functional Mock-up Interface–Interoperability & Co-Simulation of Dynamic Models

- Gaps and Overlaps
  - Non-causal connectors
  - Better coupling of 3D CAE models with dynamic system models
- Future Trends
  - Standard systems structure parameterization (SSP) of FMUs in systems models
  - Simulate complex cyber-physical systems & “systems of systems” containing multiple/many FMUs (scale)

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	35%	25%	50%	60%
2	3	2	3	3

### STRENGTHS

- Innovative & game changing open source standard for behavior model interoperability and physics-based co-simulation for MBSE
- Executable FMUs do not require licenses of the underlying solvers such as Matlab/Simulink
- Supported by 81 COTS tools today & growing
- Use in auto industry & energy/power(Europe)

### WEAKNESSES

- Standard is still relatively new and immature but is growing/evolving very rapidly
- Features need to be expanded to address the specific requirements of other applications and industry segments such as High-Tech and IoT

### OPPORTUNITIES

- Integrate with/enable other standards such as AUTOSAR, SAE 26262, DO178 and LOTAR
- Enable cross-domain MBSE for complex cyber-physical systems (software, electronics, hardware, hydraulics, etc.) with SysML
- Leverage with emerging IoT initiatives and standards – digital twin enablement

### THREATS

- Standards committee currently dominated by European Modelica community
- FMI/FMU (Modelica) standard being driven solely by automotive industry & EU research \$\$

[FMI/FMU website](#)

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards Vendors	Collaboration between S/W and Standards
4	3	4	3	4	5	4

# OMG SysML

*General purpose visual modeling language for systems engineering applications*

## ● Gaps and Overlaps

- Overlap with other standards for SE/MBSE (STEP AP233/ AP239, UPDM) and modeling tools that are established and widely used in the software development domain such as UML and AADL
- MOF & Diagram info not readily consumable by other systems
- Overlaps with other SE tools for Reqs and Arch/Info modeling

## ● Future Trends

- Very murky usage picture at present outside of Aerospace & Defense, research organizations, some Medical Device segments

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
40%	15%	20%	20%	20%
2	2	2	2	2

### STRENGTHS

- Based on very mature UML standard, with open source access and support model
- INCOSE efforts began in 2003, continuing with most recent OMG release in Sept 2015
- Over 10 commercial s/w implementations

### OPPORTUNITIES

- Adoption of SysML as a core systems model language by the major PLM software vendors
- Increasing efforts by Simulation & Analytics vendors to provide COTS support for SysML model data as inputs to systems level M&S capabilities for functional behavior predictions and requirements V&V

[www.omg.org](http://www.omg.org) ; [www.omgsysml.org](http://www.omgsysml.org)  
[www.sysML.org](http://www.sysML.org)  
[SysML forum](#)

### WEAKNESSES

- Modeling functionality incomplete/missing
- Difficult to learn and use for average design engineers not steeped in SE/MBSE practices
- Lack of adoption by industry outside of very large OEMs, primarily in Aerospace/Defense
- Work force deployment challenge – No COTS PLM-integrated offerings yet (some in process)

### THREATS

- MS Office suite is still most widely used tools for SE-related activities (easy to use, low cost)
- ALM vendors continue to use & promote UML as the preferred tool for software & electronics
- PLM vendors have not yet embraced SysML as THE common data model for conceptual systems development (RFLP) vs. traditional

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards Vendors	Collaboration between S/W and Standards
4	2	2	2	3	2	2

# Open Services for Lifecycle Collaboration (OSLC)

*Standardize tool integration - Loosely-coupled, Heterogeneous integration arch.*

## ● Gaps and Overlaps

- Gap – No enforcement mechanism exists for compliance testing
- Overlap with competing standards:
  - [OMG DDS](#)
  - [Linked Data](#) (W3C)
  - [MQTT](#) (IBM IoT standard)

## ● Future Trends

- Significant progress planned in 2016
  - Numerous solution provider offerings with OSLC
  - New domains planned

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
2	2	3	3	3

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Strong industrial and solution provider backing, across multiple industries</li> <li>• Secret sauce for ALM   PLM integration</li> <li>• IoT enablement for application   application integrations</li> </ul>	<ul style="list-style-type: none"> <li>• No enforcement mechanism for compliance testing of solution provider OSLC implementations</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Extend OSLC into Change   Configuration management, other integration domains</li> <li>• Extend OSLC into expensive, proprietary PLM   ERP integration domain</li> </ul>	<ul style="list-style-type: none"> <li>• Replacement cost of existing point-to-point integrations</li> </ul>

<http://open-services.net/specifications>  
<http://www.oasis-osl.org/>

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards solution providers	Collaboration between S/W and standards
4	5	5	4	3	4	5

# OAGIS 10

## Standardized Business Objects (XML) for supply chain transactions

### ● Gaps and Overlaps

- Overlap/compliments PLCS
  - OAGIS – supply chain
  - PLCS – technical domain
  - Overlap in supported message types

### ● Future Trends

- Cloud PLM support for PLCS, OAGIS – OAGIS 10.2

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
3	1	3	2	2

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Strong ERP, HR and financial implementations.</li> <li>• Native support with INFOR (ION)</li> <li>• Planned support with Oracle Fusion</li> <li>• UK MoD standardize on OAGIS for eBusiness</li> <li>• Recent OAGIS 10 release – Sept 2015</li> </ul>	<ul style="list-style-type: none"> <li>• Overlap/possible conflicts with PLCS on supply chain objects.</li> <li>• No identifiable PLM implementations</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Harmonize PLCS/OAGIS standards efforts to insure seamless interchange</li> </ul>	<ul style="list-style-type: none"> <li>• None noted</li> </ul>

[OAGIS Overview](#)  
[OAGIS 10.1 download](#)

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards solution providers	Collaboration between S/W and standards
5	5	5	3	3	3	5

# QIF

## *Integrated XML schema based standards for geometric tolerance testing within MBD*

### ● Gaps and Overlaps

- QIF V1.0 overlapped with DMIS V5.2 now resolved with V2.1
- Compliments AP242

### ● Future Trends

- ISO standardization
- OOTB product availability

Maturity	Adoption	Cust Requirement	Level of backing	Rate of progress
30%	30%	10%	10%	20%
2	2	3	2	3

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> <li>• Strong backing by CIMdata A&amp;D IAG – rated among top needs</li> <li>• Rapid progress on standard, with strong international industry business backing.</li> <li>• ANSI standard</li> <li>• Use of Persistent ID's in QIF eliminates identifier conflicts</li> </ul>	<ul style="list-style-type: none"> <li>• Emerging standard, not yet widely available OOTB. This is mitigated by rapid software provider support that is currently underway.</li> </ul>
OPPORTUNITIES	THREATS
<ul style="list-style-type: none"> <li>• Cost reductions in manufacturing and for after-market service parts</li> <li>• Enables Industry 4.0 Smart Manufacturing</li> </ul>	<ul style="list-style-type: none"> <li>• None apparent</li> </ul>

[QIFstandards.org](http://QIFstandards.org)

Degree of Openness	Interop Verification	Key Company Influencers	Adoption by Industry	Adoption by SW providers	Adoption by Standards solution providers	Collaboration between S/W and standards
5	5	4	3	3	5	5

# Takeaways

*What do you do with all this information?*

- Insist on PLM Standards compliance from your PLM providers, ***if they are critical to your organization and its initiatives moving forward***
- To the extent possible, participate in the standardization efforts for the PLM standard(s) that are ***mission critical and practical*** for you.
- Consider participation in CIMdata Industry Action Groups:
  - Aerospace & Defense PLM Action Group – Contact Jim Roche [j.roche@CIMdata.com](mailto:j.roche@CIMdata.com)
  - Industrial Action Group – Contact Ed Martin [e.martin@CIMdata.com](mailto:e.martin@CIMdata.com)
  - Medical Device Action Group – Contact Chuck Ditchendorf [c.ditchendorf@CIMdata.com](mailto:c.ditchendorf@CIMdata.com)
  - Collaborate on best practice research and standard efforts

# Balance Adherence with your Firm's PLM timeline

- Rigid standards compliance can asphyxiate any PLM initiative/upgrade
  - If a department wants to kill a particular initiative, it can do so easily to the detriment of the business' bigger picture.
  - It can be used as a tool of internal politics to the detriment of the business' bigger picture.
  - Triage (holistically and honestly) and determine which few standards are important to your overall PLM landscape and explore and steer options that way....with timeframes in mind.
- On the other hand, PLM providers' compliance comes in different potencies and commitments
  - PLM Solution providers typically resist standards unless they either made them up or they were a part of their original strategy.
  - Critical standards can also weed out potential suppliers. Be wary of "we'll be supporting this at some future release."





# Q&A

*Let's hear what's on your mind?*



# For More Information, Contact...

*We look forward to hearing from you*

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# Next CIMdata Leadership Webinar

- Please join us at 11am ET, 15 December 2016 for the next Complimentary CIMdata Educational Webinar
  - Want to Trust your Connected Intelligent Products? Deploy Knowledge Systems for Reliability Design
  - Dr. Venkatesh “Venki” Agaram, Director - Quality & Reliability Engineering Practice, CIMdata
- Mark your calendars for 2017 – CIMdata PLM Webinars
  - 2<sup>nd</sup> Thursday of each month @ 11am ET!

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