Digital quality management from design to production

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## AGENDA

Digital quality management from design to production

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Introducing Adient
Who we are.
What we do.
Worldwide industry leadership

We are among the Top 10 Global OEM auto parts suppliers in the world.

Global sales in 2015: $23.9 B
Seat systems per year: 25 M+

We enjoy a clear leadership position as the world’s largest automotive seating manufacturer, with twice the global share of our nearest competitor.
Located right where our customers need us most

**Global locations**

- **Amount**: 230+
- **Countries**: 33

**Employees**

- **Globally**: 75,000+

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- **North America**: 38 Locations
- **Europe**: 91 Locations
- **South America**: 10 Locations
- **Africa**: 6 Locations
- **Asia**: 91 Locations
Working with the world’s largest auto manufacturers

Automotive seating customers

We work with the world’s largest auto manufacturers, supplying parts for the most important automobile brands across the globe.
The right products

Global market leader in complete seats and all the major components.
Our reputation as the global leader in automotive seating begins with our products

Complete seats

Our complete seating systems excel in quality and craftsmanship. Every step of our process, from design to assembly, is completed in-house – so we can ensure our products are safe, stylish and comfortable for both our customers and their end-consumers. And with our easily adaptable core components, we can develop precisely right solutions that support multiple automotive makes and models.
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Digital quality management between development and production

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Motivation 2015

Today

Future: intelligent tools, intelligent products, intelligent communication, fundamental 3D master
Process and Pain Points 2016

Pain Point

- Bad GD&T quality.
- Mismatching with FMEA,
- Different CAD systems CATIA and NX

Pain Point

There is no standard available today.

Pain Point

The drawing-less process ("3D-Master") and the exchange of 3D Measurement Data has not yet been sufficiently described for metrology.
Process Status 2017

Pain Point

- Bad GD&T quality.
- Mismatching with FMEA,
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User Training

POC/Pilot at Adient

Pain Point

There is no standard available today.

User Training

Design Engineer

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VDA / ProSTEP iViP recommendation

“3D Measurement Data Management”
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Motivation

- The technical drawing, which is still a key element within the measurement process, gets replaced by drawing-less concepts, being frequently referred to 3D-Master.
- The process needs to get ready for these modern technologies.
- The lack of standards at OEMs and suppliers leads to inefficient processes creating increasing costs.
• The availability of one single interface format for all information required within the measurement process would enable the OEMs and suppliers to implement highly automated processes based on a common data model.
• Enable a central data-hub and modern IT architecture as an option.
High level Scope

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I++ DMS

DMS = Data Management Services
DME = Dimensional Measurement Equipment
Participants

3D Measurement Data Management Workflow Forum
- Airbus
- Adient (Chair)
- BMW
- Continental
- Daimler
- Ford
- Opel

3D Measurement Data Management Implementor Forum
- ATS
- CENIT
- DUWE 3D
- Gigatronik
- GOM
- Hexagon Manufacturing Intelligence
- Kronion
- MAP VISION
- Siemens PLM
- WENZEL Software Solutions
- Zeiss IMT

User Group of Automotive and Aerospace Companies

Group of Measurement Equipment and Software Vendors

Coordination for both groups is done by PROSTEP AG
ACTIVITIES 2016
A reference process was derived from the requirements collected in order to define the scope of the interface definition.
• The first step was taken in 2016 with user requirements relating to a data exchange format in the measurement process being collected and prioritized.
• The existing I++ DMS UML model was thoroughly revised with regard to readability and documentation to provide software houses and measurement equipment manufacturers with support when implementing the interface.
Implementor Awareness Meeting

An information event for system vendors was held in October 2016 in preparation for the Implementor Forum, which is launched in 2017 now. All the representatives of the software houses and measurement equipment manufacturers who attended the event recognized the great potential that a sector-wide activity for harmonizing the interfaces offers.

20 participants
14 represented Tools
From 12 system vendors
CURRENT WORK
Project Plan 2017

- In addition to increased focus on user requirements and use cases and the publication of an initial version of a PSI/PDA Recommendation, it is also planned that extensions be developed that provide support for additional measurement methods and application domains.

- Preparations for the launch of an Implementer Forum will also be made. The objectives are an exchange of experiences among the software vendors, harmonization of the implemented interfaces, creation of implementation guidelines for more efficient software development as well as internal testing "behind closed doors".

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Overall Project Plan (Overview)

- **Workflow Forum**
  - 4 Workshops
  - Update of PSI/VDA recommendation

- **Implementer Forum**
  - Kick-Off + 3 Workshops
  - Harmonization of I++ DMS implementations

- **Public Work to boost 3D MDM**
  - Conferences, Publications, …
3D Measurement Data Management Workflow Forum

- Publication of Recommendation
- Public Work: Booth @ Control May 9th -12th
- Publications
3D Measurement Data Management Implementor Forum

May 4th: 3D MDM IF Kick-Off Meeting

ATS
CENIT
DUWE 3D
Gigatronik
GOM
Hexagon Manufacturing Intelligence
Kronion
MAP VISION
Siemens PLM
Wenzel Software Solutions
Zeiss IMT

Upcoming Events:
Phone Conference: August 3rd
Face to Face Meeting: September 14th
Joint Meeting with 3D MDM WF: November 15th
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3D Measurement Data Management Workflow Forum

- 3D MDM recommendation V1:
  - Core (I++ DMS) quality features, tolerances, meta data

- Public Work: Publication of White Paper & PDJ Article

- Technical Work:
  - Elaboration of further Use Cases
  - Extension of I++ DMS

→ 1st Update of recommendation:
  - e.g. measurement strategies, measuring principles, evaluation rules

→ 2nd Update of recommendation:
  - e.g. Measuring points, measurement procedures, evaluation layouts
3D Measurement Data Management Implementor Forum

- Test of Implementations
- Recommended Practises
- Workshops
  - to give Implementation support
  - to harmonize implementations of I++ DMS

Diagram:
- Use Case definition
- Derivation of requirements
- Requirements gathering in JIRA
- Assignment of requirements to use cases
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I++ DMS support the Drawing less process

- One Single Master
- Control plan digital available
- Measurement results digital available
- Enable global reports and analysis
- Visualization based on international standards
- Entry point for an automated dimensional quality control in Industry 4.0 systems
- Translation into neutral formats
- Translate CAD model into viewing format (JT / 3DPDF)
- Based on ZLP and 3D MDM recommendations.
Process Status 2017

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VDA / ProSTEP iViP recommendations
3D Measurement Data Management & Drawing Less Process (VDA 4953-2 ZLP)
Strategic PLM-Themes

Agile Product Development
Integration
ALM – PDM – ERP
Digital Master & Digital Twin
Systems Engineering
Cross-Company Collaboration
Complexity and Variant Management
Model Based Design

Data and Interface Standards

PLM Technologies

Real-Time Collaboration
Linked Data & Semantic Networks
Federated, Modular and Open Architecture
Cloud and Platform Technologies
Role-Based Functionality
Virtual Reality
THANK YOU!

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