Uniting PLM & ERP

for a complete

3D MBE

Deployment

Anark Corporation

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Agenda

• Anark Introduction
• 3D Model-Based Enterprise
  • Definition
  • Traditional Barriers
  • How did the DoD move past Level 2?
• Uniting PLM and ERP data for generating 3D MBE documents
• Successful 3D MBE deployments
• 3D MBE ROI
• Leading provider of advanced MBE and Visual Communication software and solutions to industry leaders since 2000.

• Empowering 3D Model Based Enterprise revolution within Aerospace, Defense, Automotive, Energy, Industrial, Electronics, Medical Equipment, and Consumer Products Sectors

• Growing company, with world-wide network of technology, integration, and channel partners

• Anark Corporation HQ in Boulder, Colorado
What?
• Fully integrated and collaborative environment founded on detailed 3D product definition shared across the extended enterprise

How?
• A single digital master data set containing the 3D model and all needed product data in a managed secure and controlled environment that supports maximum data reuse for all aspects of acquisition, maintenance and operations.

Why?
• Rapid, seamless, and affordable deployment of products from concept to disposal.
Model-Based Enterprise
How to Drive through Level 6 (DTL6)

**Level 0**
- 2D Drawings only

**Level 1**
- 3D Neutral CAD to CAM+2D Drawings

**Level 2**
- 3D Native CAD+CAM & 2D Drawings

**Level 3**
- 3D MBD in Native CAD & Light Weight. Viewable (3D PDF)

**Level 4**
- 3D MBD deployed from PLM

**Level 5**
- Automated 3D MBE Deployment to Internal Operation

**Level 6**
- Automated 3D MBE Deployment to External Supplier Operations

**Drawing Centric**
- 2D Engineering Drawing Definition
- Forces Paper Driven Processes

**Model Centric**
- 3D Model Based Definition
- Allows 3D MBE Manu & Supplier Processes

**MBD-Centric**
- Many Stuck on Level 2

**MBE-Centric**
- Because MBD Data in CAD ≠ MBE Data Downstream
What prevents moving past Level 2?

• Cultural Resistance/Inertia to moving away from 2D Drawings

• Inability to move CAD Native to neutral formats with 100% fidelity

• Semantic Engineering Design Intent must be accurately conveyed

MBE Viewing Technology Costly and Inflexible
  • CAD Viewers are proprietary, hard-coded, model-spinners with minimal MBE capabilities
  • Suppliers were adverse to buying, installing and managing multiple CAD viewing clients

• Full Product Definition is more than CAD MBD data
  • Required Data may also reside in PLM, ERP, MES, CRM, …
How did the DoD move past Level 2?

- Native CAD APIs for reliable access to 3D MBD data
- 3rd party validation of all 3D Model Translation
- Leverage Open Formats for 3D MBE documents
  - 3D PDF - ISO standard with robust 3D MBD support
  - HTML5 + WebGL
- Server-based automated publishing and regeneration
  - SOA/Webservices
  - Data Connectors for pushing and pulling data from multiple systems
- MIL-STD 31000 rev A – ratified in Dec 2013
  - Mandates all new system acquisitions include 3D Tech Data Packages
Anark Core Platform

Unite CAD/PLM & MES/ERP to Create Fit for Purpose MBE Documents

Product and Process Definition (Content)

Product & Process Definition Combined (United)

Recipe-Business Rules Using Templates (In-context)
3D MBE Successful Deployments

- US Army – ARDEC – TDPs
- US Navy – NAVAIR - TDPs
- Boeing – A10 Wing Replacement Program – Parts Provisioning Reports
- Hill Air Force Base – PPRs, TDPs, Model-based Work Instructions
- Honeywell – TDP, MBWI
- General Electric - TDPs
- Raytheon – TDPs, Quality Inspection Plans
- Lockheed Martin - TDPs
- General Dynamics - TDPs
- Navistar - TDPs
- CSR-Sifang - MBWI
- TE Connectivity - TDPs
Customer Samples - NAVAIR

Technical Data Package

- 3D PDF from native Creo
- 3D MBD and Windchill Attributes
  - Title Block, Rev History, BOM, Mfg Notes, Approvals
- Validation Report
- BOM
- Validated STEP File
3D Process Planning Documents

Automated publishing combines
- CAD MBD engineering
- BOM (PLM)
- Process data (ERP)
- Part Attributes (ERP)
Customer Samples – Boeing

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5000 A-10 Wing Parts

- Native NX
- TeamCenter
- SlicWave Provisioning Attributes

Into Lightweight 3D PDF PPRs

**Selected Part:**

- **Part Number:** 1620713100-1001
- **Revision:** 04
- **Cage Code:** 98747
- **Title:** SLAT ASSY LH (Configuration Item)
- **Release Date:** 3/15/2010
- **Work Authority:** FARS202-07-D-0004
- **Class:** Assembly Revision
- **Type:** Assembly - Base Bill

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Customer Samples - Navistar

Native NX + Teamcenter Attributes

100% Drawingless Product Definition
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<th>Reduction</th>
<th>Action</th>
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<tr>
<td>50%</td>
<td>Tooling design &amp; fabrication</td>
</tr>
<tr>
<td>33%</td>
<td>Overall assembly hours</td>
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<tr>
<td>30%</td>
<td>Rework</td>
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<td>50%</td>
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<td>20%</td>
<td>Scrap and Rework</td>
</tr>
<tr>
<td>50%</td>
<td>Supplier Response Time</td>
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</table>


Benefits of 3D MBE

- 30% Reduction in Engineering Time & Cost
- 50% Reduction in Tooling Design & Fabrication Costs
- 30% Reduction in Overall Assembly Time
- 20% - 30% Reduction in Mfg. and Supplier Scrap and Rework
- 50% Reduction in Mfg. and Supplier response time
Contact Info

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Unleash the Model Based Enterprise
Appendix – Additional Slides
Anark Core Product Line

Anark Core Server—enterprise MBE server software with SOA for recipe-based transformation, publishing, and collaboration. Advanced MBD CAD integrations to NX, Creo, CATIA, and SolidWorks.


Anark Core SDK—Integration software development kit for connecting Anark Core software to other enterprise data sources and workflow engines.

Anark Core Integrations for PDM—Reference integration code for Teamcenter, Windchill PDMLink, ENOVIA, and SolidWorks EPDM for workflow-driven, recipe-based publishing automation. Provided as a service to our enterprise customers. Aras and Autodesk Vault are next up.
Anark Core Product Licensing

Anark Core Server—licensed per OS server instance. Per user licensing is possible in contexts where user licenses are enforced (e.g. in the context of a PDM system like Teamcenter).

Anark Core Workstation—licensed per simultaneous desktop user (floating), similar to NX.

Anark Core SDK—licensed per IT development team.

Anark Core Integrations for PDM—provided as a service to Anark customers.
Anark Core Key Commercial Differentiators

1. Unites **CAD/PLM with MES/ERP** for “In-Context” Enterprise document generation

2. Transform **multiple sources of product data** based on **Enterprise Business Rules (Anark Core recipes)**

3. Multi-CAD support with **accurate & trustworthy MBD**

4. Server-based **automatic document generation & regeneration** based on source data changes, serving multiple engineering and manufacturing use cases.

5. Server-based **collaboration capabilities** for managing supply chain comments and markup.

6. Template based delivery platforms (3D PDF & 3D HTML), that are **FREE to View** and **FREE to deploy**
Transform Master Data and Achieve ERP-PLM Harmony

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Anark Core™

- Engineering Release Publishing Automation
- Procurement SCM Design Collaboration
- Quality Inspection Planning & Execution
- Mfg Process Planning & Execution
Anark Core MBE Cloud and Mobile Platform

- Deliver the **Fantastic Four** to Web & Mobile
- Anark Core Services available from Any Device
- Robust HTML5 Application Publishing w/WebGL
- Multi-tenant Architecture
- Intelligent Clustering and WAN Localization
- Fully Virtualized for Private or Public Hosting
- No end-user licensing fees—free to view, free to deploy!