Publication and Validation Strategies to enable a Model Based Ecosystem

- Anark Corporation
- International TechneGroup Incorporated
Today’s Speakers

• Tony Provencal - ITI
  • Director of Technical Sales & Services

• Jim Merry – Anark
  • Senior Director, Enterprise Sales

• Jim Martin – Anark
  • Director of Marketing & Sales Enablement
Agenda/Objectives

• Evolution of digital authority
• Standards based content publishing
• Validation strategies and challenges
• Considerations for new standards formats
ITI solves complex product data interoperability problems, so that our customers can focus on making great products.

**Customer Initiatives**
- Model Based Enterprise
- Product Lifecycle Mgt.
- Advanced Simulation
- Digital Manufacturing

**ITI Solutions**
- Conversion
- Integration
- Validation
- Migration

**Locations**
- Milford, Ohio USA (HQ)
- Cambridge, UK
- Munich, Germany
- Tel Aviv, Israel
- Bologna, Italy

Founded in 1983 | 140 Employees
Leading provider of technical content management software and solutions, with activity-based visual collaboration and connected digital workflows.


Growing company with worldwide network of technology and integration partners.

Anark Corporation HQ in Boulder, Colorado, with offices in the Washington DC, Detroit, Chicago, San Francisco, and Bangalore.
Smart, Connected, Collaborative

**Intelligent Information Management (IIM)** defines all the strategies, methods, and tools utilized to capture, create, store, secure, analyze, deliver, and automate data. IIM is all about Data AND Content, not Data OR Content. - *AlIM*

**Industry 4.0** fosters what has been called a "smart factory". Over the Internet of Things, cyber-physical systems communicate and cooperate with each other and with humans in real-time both internally and across organizational services offered and used by participants of the value chain. - *Industrie 4.0 Working Group*

**The Digital Thread** refers to the communication framework that allows a connected data flow and integrated view of the asset’s data throughout its lifecycle across traditionally siloed functional perspectives. - *Industry Week*

**Model-Based Enterprise (MBE)** is a fully integrated and collaborative environment founded on 3D product definition detailed and shared across the enterprise; to enable rapid, seamless, and affordable deployment of products from concept to disposal. - *DMDII*
Technical Data Packages and the Digital Thread

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- Technical Data Package (TDP)
  - Item Configuration
  - Bill of Materials
  - Drawings/Blueprints
  - Specs
  - Item Attributes
  - Standards
  - Instructions
  - Revision Detail
  - Cost Detail

- Innovation Management
- Enterprise Product Record
- Product Development
- Enterprise Quality Management

- New Ideas
- Corrective Actions
- Cost Savings
- Increased Opportunity

- Continuous Improvement

- Digital Product Release
- Sales
- Supply Chain
- Sourcing
- Manufacturing
- Contract Mfg
- Service

- Enterprise Quality

-反馈
- Issues
- IoT Data

- Customers
- Assets
- Ideas
- Concerns
Generation and Validation of Targeted Standardized Content
Evolution of Digitization, Authorization, & Trust

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Drawing Centric Ecosystem

Model Centric Ecosystem

Model Based Ecosystem

PLM

AUTHORITY

PUBLISHED CONTENT/DERIVATIVES

PDF

PDF

NATIVE

STEP

NATIVE

STEP

QIF

PDF

STEP

QIF

HTML 5

gltf
Anark Content Services for the Digital Thread

ANARK CORE™ SERVER
Publishing Automation Services

- Technical Data & Files
- Recipe Actions

ANARK CORE™ MBEWEB
Content Management & Collaboration Services

- Role-Specific Technical Web Content
- Consume & Collaborate

- PLM, SCM, ERP
- PDF

- PLM, SCM, ERP, MES, IOT
CADIQ Validation Use Cases

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**Quality Checking**

**Identifying Defects**
- Structure & Integrity
  - Non-solid model, non-parametric model, large model, degenerate entities, over-used edges, etc...
- Manufacturability
  - Narrow solid, narrow space, narrow valley, solid void, tiny rounds, narrow step, deep hole, etc...

**Revision Comparison**

**Identifying Changes**
- Features & Attributes
  - Features/components added/removed
  - Parameters added/removed
- Parameter changes
- Geometric Entities
  - Flat surfaces, curved surfaces, holes, added or removed
- Surface location, orientation, length, diameter changes

**Derivative Validation**

**Identifying Differences**
- Shape & Structure
  - Parts, surfaces, curves, points, etc... added or removed
  - Parts, surfaces, curves, points, etc... changed
- Properties & Attributes
  - Model tree nodes added, removed, or changed
  - Volume, area, color, entity count changes

**Derivative Validation**

**Identifying Differences**
- Semantic
  - Annotation added or removed, annotation type change, annotation face area change, merged annotations, etc...
- Graphic
  - Saved view added or removed, annotation location change, annotation view direction change, etc...
### Key Points

1. **Automation**
2. **MBD**
3. **PMI Validation**
Key Validation Planning Considerations

• Automation
  • PLM driven
  • High volume/scalability
  • Can start with geometry only

• MBD
  • Translation/Precise vs Transformation/Graphical
  • Human consumption vs. Machine consumption
  • Transformation = decoder ring required

• PMI Validation
  • Semantic properties
  • Cross highlighting
  • View based visibility

“Fit for purpose” validation is required in designing effective validation workflows.
The NAVAIR 53K Project
Informed Reality (IR)
• Anark content with responsive templates can be accessed directly in browser-enabled wearables such as Realwear or Glass, for hands-free, informed reality (IR) experiences

Virtual Reality (VR)
• Anark IIM technical web content can be delivered as rev-controlled, authoritative visualization data and attributes to virtual reality (VR) applications through microservices

Augmented Reality (AR)
• Anark IIM technical web content can be delivered as rev-controlled, authoritative visualization data and attributes to augmented reality (AR) applications through microservices
Anark Open Standards for Technical Content

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Thank You
Supporting Slides
**Anark Core Platform Products**

**Anark Core Workstation**: Desktop software for defining server-side “recipes” for publishing automation workflows, and SME authoring for technical content generation.

**Anark Core Server**: Server-side publishing automation software for recipe-based technical content publishing, with a lightweight, agile integration architecture using REST services.

**Anark Core MBEWeb**: Web content management software that hosts template-based technical content, with faceted search, content-aware DRM, and visual collaboration capabilities.

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

**Anark Core Reference Integration for PLM**: Reference integrations for Teamcenter, Windchill, ENOVIA, and SW PDM, for workflow-driven, recipe-based publishing with Anark Core Server.

**Anark Core Integration for MCAD**: Native integrations for Creo, NX, CATIA, SolidWorks, and Inventor, available for Anark Core Workstation and Anark Core Server.
Enabling effective product data re-use across design and manufacturing engineering systems

**CAD Quality and Validation**

**Supplier/OEM Data Exchange**

**Legacy CAD Migration**

**CAD to CAE Integration**

**Design to Manufacturing Integration**

Clearing obstacles for the Model Based Enterprise
Integrate the CAD design, engineering part, ECR/ECO, and release to production processes

Integration
Migration
Consulting

Vendor Partnerships:
CADIQ Products

CADIQ: Desktop software for defining “job templates” for validation, and dedicated user usage for investigating differences between 3D models.

CADIQ Server: Server-side software, for on-demand and workflow driven validation and reporting driven by another automation platform such as PLM.

CADIQ System Interfaces: API based interfaces for CATIA, NX, Creo, SOLIDWORKS delivering OEM accuracy for evaluating native CAD graphical and semantic content.

CADIQ File Interfaces: Library based interfaces for PDF/PRC, STEP, JT, QIF and more, for evaluating ISO standard and industry neutral format content.

CADIQ Reference Integration for PLM: Reference integrations for Windchill, for user-driven and workflow-driven, recipe-based publishing with Anark Core Server.
ITI – Corporate Partnerships

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CAD, PLM and OEM Partnerships

- Autodesk
- Dassault Systèmes
- PTC
- Siemens
- aras
- ANARK®
- ANSYS
- EDEM®
- HiCAD
- iCAD.jp
- ΣEMMA
- Simufact