

Technical Enterprise Content Management & Visual Collaboration

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GLOBAL PRODUCT DATA INTEROPERABILITY **SUMMIT** 2018



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Agenda

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- Anark Company Overview
- Review key concepts, benefits & industry trends such as Industry 4.0, Digital Thread, and Model-Based Enterprise (MBE)
- How to successfully transform critical engineering, manufacturing and operational data into “fit-for-purpose” technical content that can be consumed on virtually any device along the Digital Thread
- Demonstrate the power and efficiency of connected, web and template-based technical data exchange with “social-media” style commenting and technical collaboration as a modern replacement for conventional ad-hoc, disconnected, legacy modes of data exchange and communication.

Anark Corporation

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Leading provider of technical enterprise content management (ECM) software and solutions with advanced visual collaboration for enterprise manufacturing

Empowering the MBE and Digital Thread revolution within A&D, Energy, Industrial, High Tech, Automotive, and Medical Equipment Sectors

Growing company with worldwide network of technology and integration partners

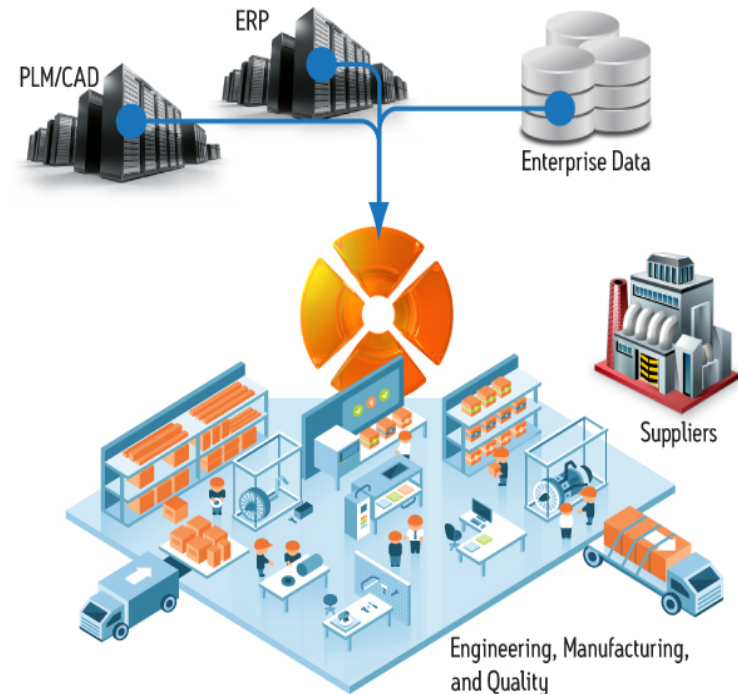
Anark Corporation HQ in Boulder, Colorado, with offices in the Washington DC, Detroit, Chicago, San Francisco, and Bangalore



Anark Technical ECM Platform – Connecting the Digital Thread

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- **Enables manufacturers** to easily transform critical PLM & ERP data into powerful, role- and-use-case-specific 3D PDF documents and HTML5 web content that can be consumed on virtually any device
- **Empowers knowledge workers along the Digital-Thread** to communicate and collaborate more effectively and securely throughout engineering, manufacturing, supply-chain and field service operations.
- **Most advanced support for powerful model-based enterprise (MBE) process change**, yielding higher quality products, accelerated release cycles, and reduced scrap and material waste, netting substantial cost savings for OEMs and their suppliers.



Anark Implementation and Technology Partners

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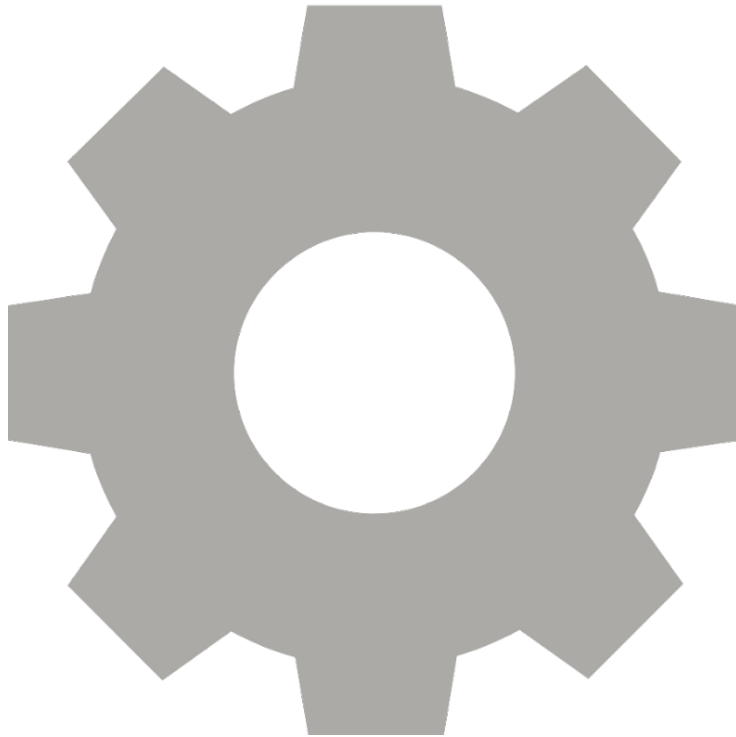
Implementation, Integration & Training



PLM – ERP Technology Partnerships



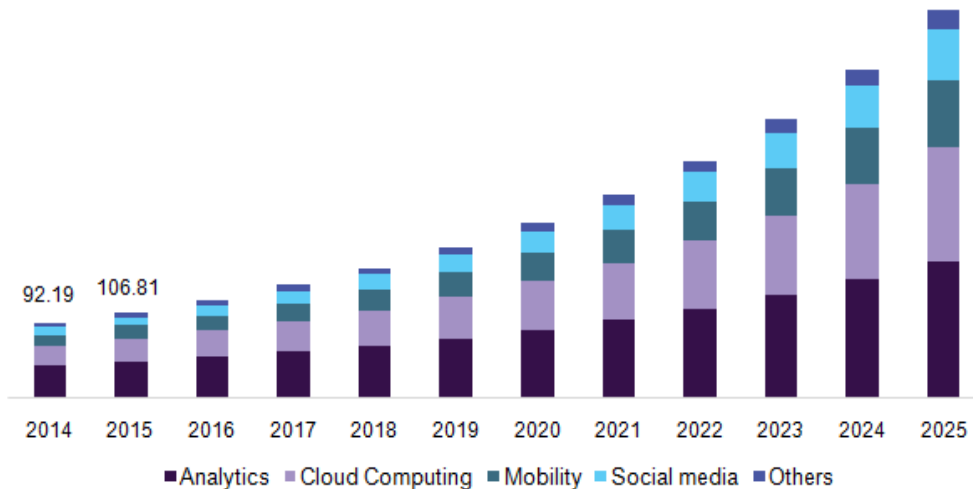
Anark's platform extends the capabilities and value of the leading CAD, PLM, ERP, MES and SCM vendors' products, and the company has attracted leading services, integration, educational/training partners to develop Anark centric deployment and implementation services offerings.



Digital Transformation - Industry Trends & Opportunities

Rapid Growth, High Value - Industry 4.0 & Digital Transformation Markets

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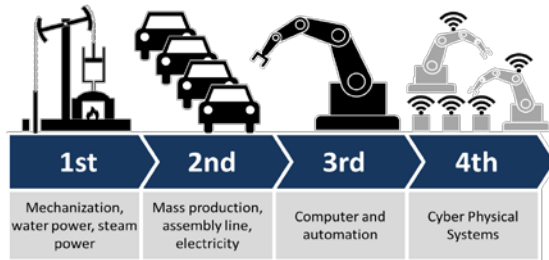


- **Global *digital transformation market*** expected to reach **USD 798.44 billion by 2025** - Grand View Research
- **Industry 4.0 Market** is expected to exceed **USD 214 billion by 2023** according to “Industry 4.0 Market & Technologies 2018-2023” - Markets and Research

- OEMs under pressure to improve quality, minimize waste, comply with regulations, and more rapidly satisfy customer demand.
- Digital Transformation strategies are built upon smart, connected Digital Thread/Twin, IOT, AI, AR, additive mfg, and Model-Based Enterprise (MBE) processes and solutions.
- Cloud, big data, mobile, and IOT empower smart, connected digital processes for efficient, information-rich data sharing and collaboration throughout the enterprise and supply chain, and into the field.

Smart, Connected, Collaborative

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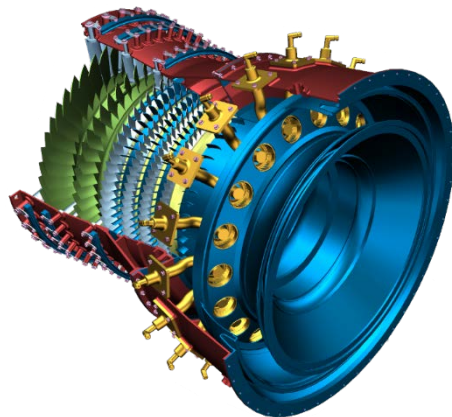
Industry 4.0 creates what has been called a "smart factory". Over the Internet of Things, cyber-physical systems communicate and cooperate with each other and with humans in real-time both internally and across organizational services offered and used by participants of the value chain. -

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*



Digital Thread and MBE Benefits

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20%

improvement
in new product
introduction



30%

reduction in
engineering time



20%

reduction in
manufacturing
and supplier
rework



74%

reduction
in design,
manufacturing
and inspection
cycle time



77%

reduction
in supplier
response time

Sources: Benchmark & research studies presented by LNS Research, US Navy Naval Air Command, and National Institute of Standards & Technology (NIST)

Anark's customers are benefitting from the successful implementation of collaborative, information-rich Digital Thread initiatives; they are coming to market faster, with higher quality products, with significant cost savings.

Adoption Challenges

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- Customers struggle with PLM/ERP functionality gaps & limited interoperability which stymies adoption.
- Existing solutions for data sharing, collaboration, and visualization are often proprietary, rigid, ad-hoc and not well suited for a modern web-based Digital Thread paradigm.
- Customers are challenged with managing a wide array of disparate technical data types/file formats required to achieve enterprise digitalization.
- Until recently, enterprise OEMs and their suppliers have been slow to implement public cloud strategies.

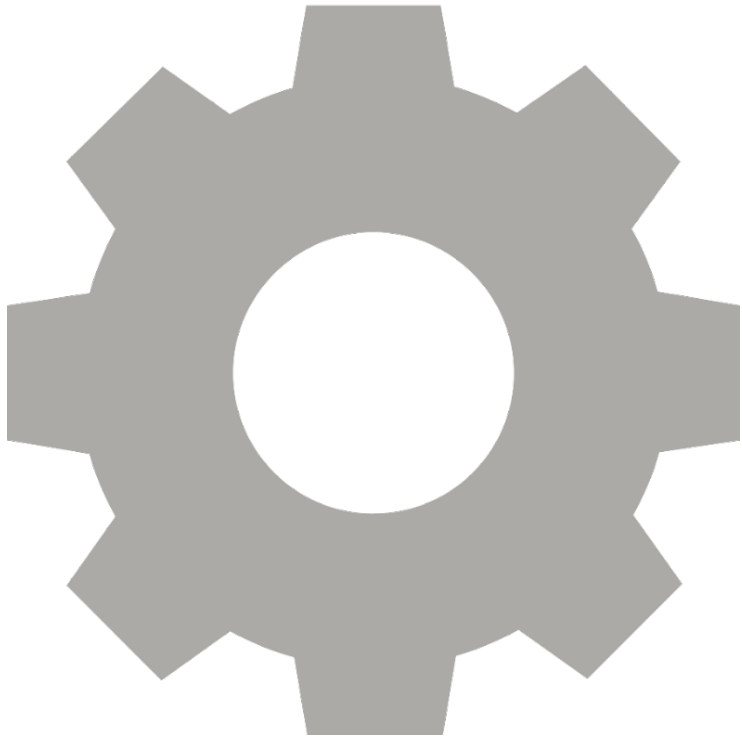
Anark Technical Enterprise Content Management Solution

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Anark ECM platform is uniquely positioned to build on the emerging **Industry 4.0 & Digital Transformation** trends by:

- Publishing flexible, open-standards-based web content that can support granular IT architectures, including IOT services,
- Democratizing domain-specific technical data such as MCAD, ECAD, and
- Providing a scalable horizontal content management and collaboration infrastructure that is as easy to use as it is to deploy.



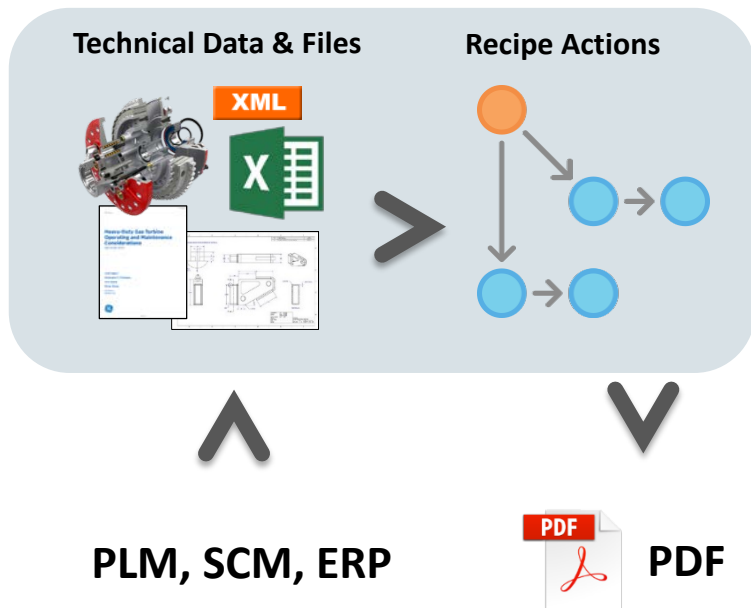


Empowering the Modern Digital Enterprise

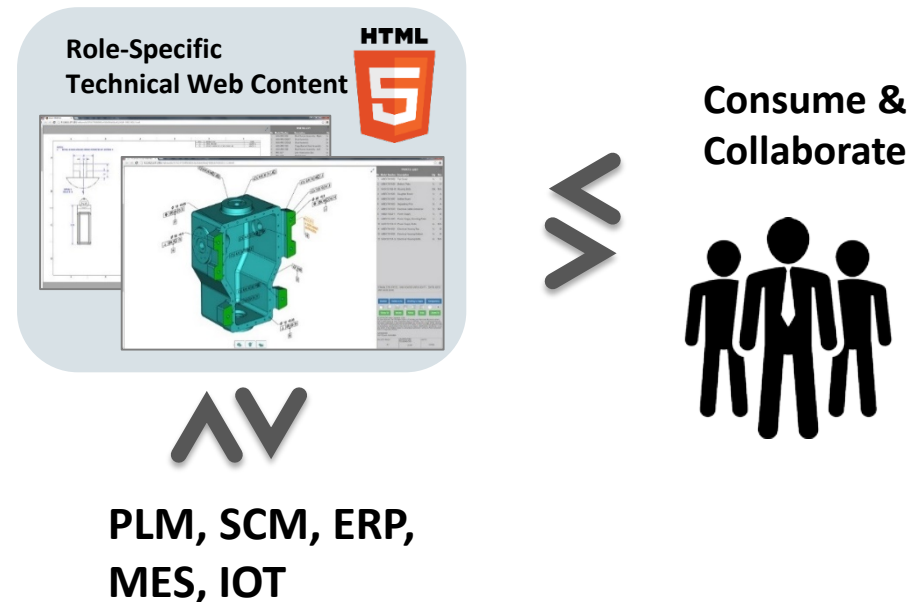
Anark ECM for the Digital Thread

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Anark Core™ Publishing Automation Services



Anark MBEWeb™ Content Management & Collaboration Services

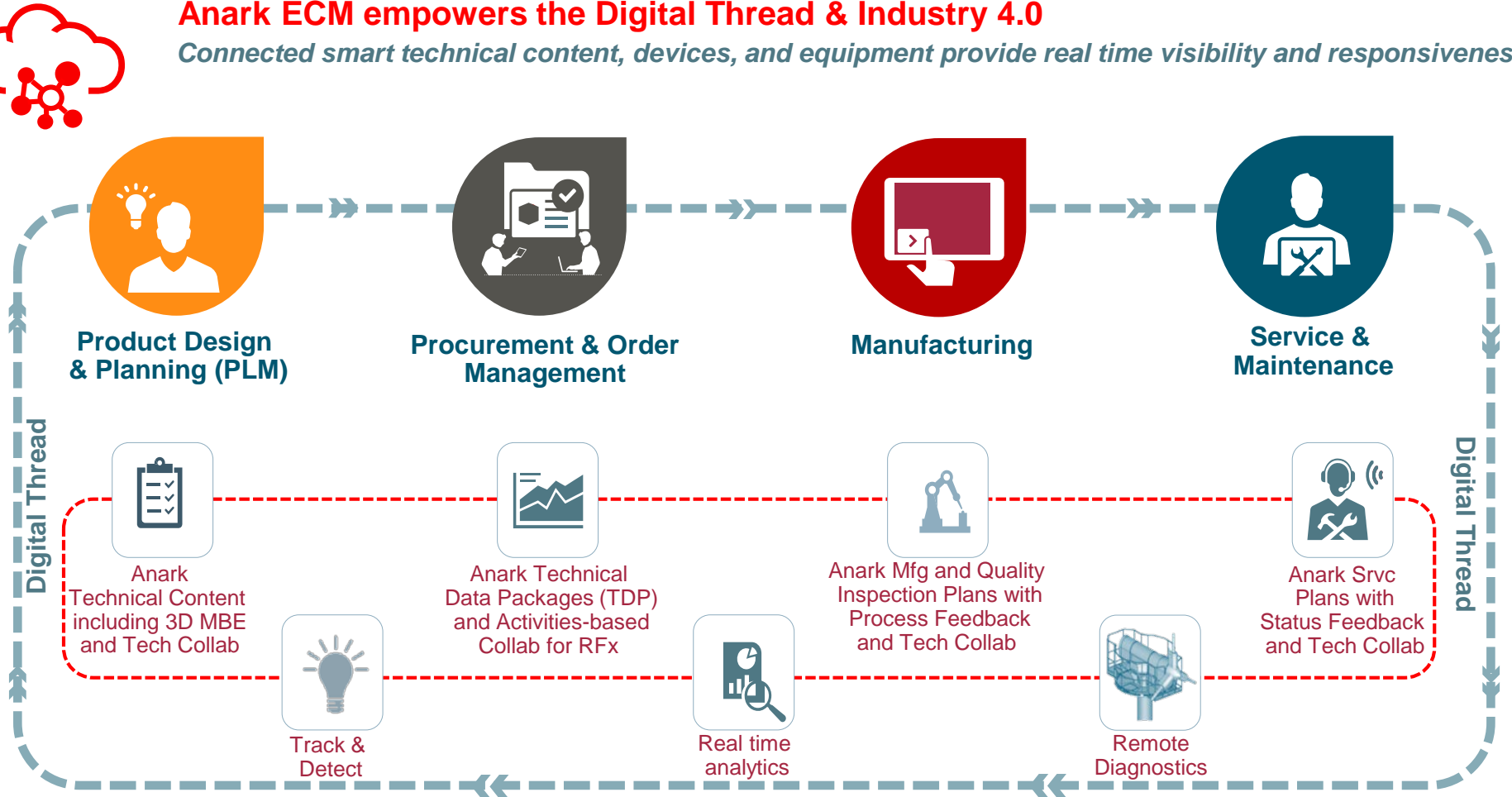


Modern Digital Enterprise

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Anark ECM empowers the Digital Thread & Industry 4.0

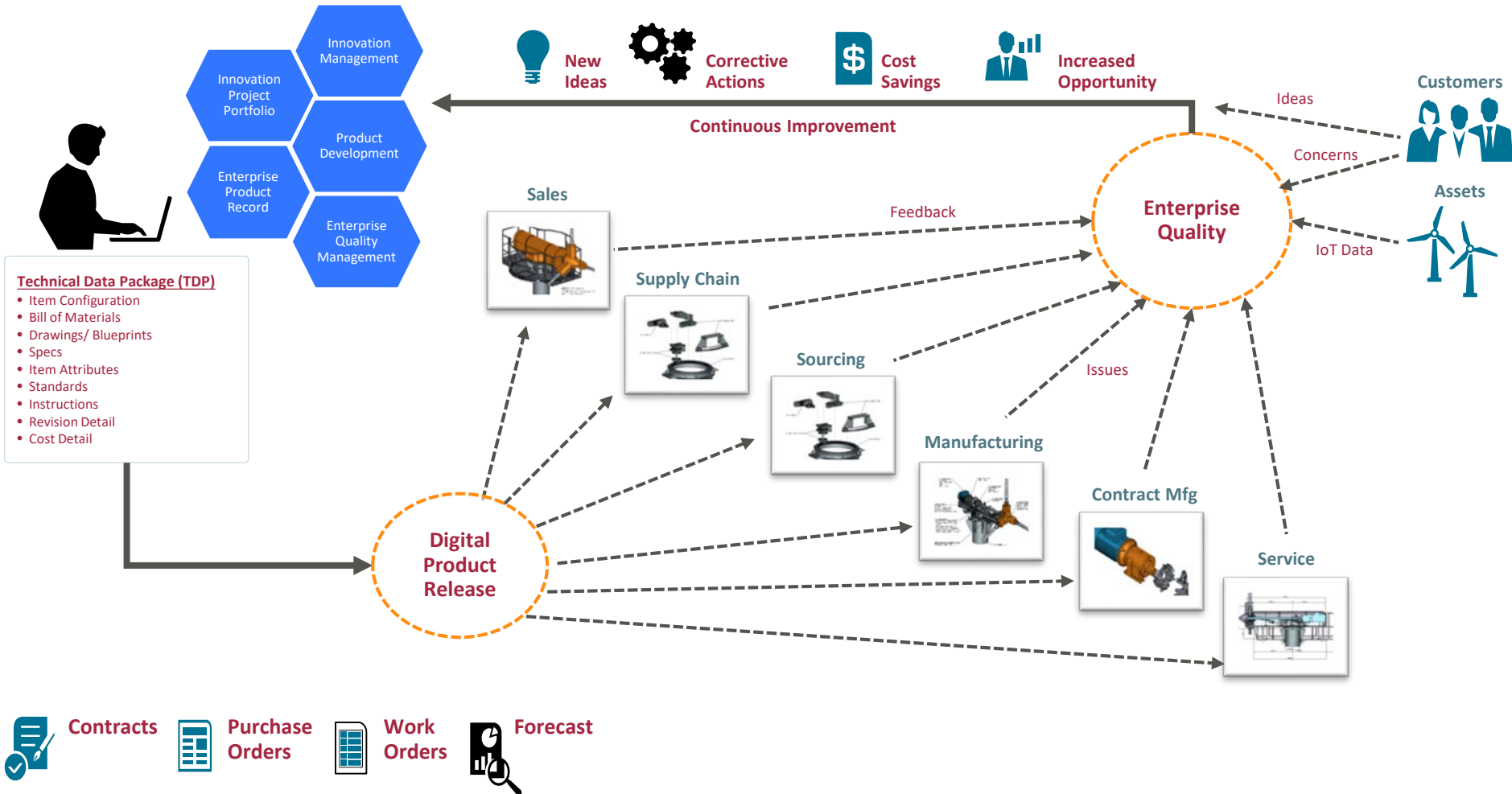
Connected smart technical content, devices, and equipment provide real time visibility and responsiveness



Anark ECM provides deeper technical insight for product improvement and maintenance

Technical Data Package

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Product Design & Planning (PLM)



Product Design & Planning (PLM)

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Anark ECM generates and manages smart technical content

- Anark ECM platform can bring modern TDP web content to product planning:

- Item configuration BOM
- Change history
- Materials specs
- Manufacturing notes
- Quality characteristics
- 3D from all major CAD formats, with optional MBE
- 2D drawings and schematic sheets
- PCB/EDA support (IPC-2581 coming soon)

- Anark activities-based technical collaboration can help teams identify KPCs critical to product success.

From here, David can access all the technical detail in BOM. There are attachments with the latest changes and detailed specification notes on what has been revised on the Brake.

No.	Model Number	Description
1	WT000500	Wind Turbine with Tower
2	WT000502	Wind Turbine Assembly
3	WT000203	Control/Generator Assembly
4	WT000110	Generator
5	WT000120	Nacelle
6	WT000123	Rotor Assembly
7	WT000130	Hub
8	WT000135	Rotor Blade
9	WT000230	Angular Control Assembly
10	WT000240	Drive Assembly
12	WT000145	Gearbox
14	WT000150	Rotor Stopper
15	WT000147	Shaft Locking Assembly
16	WT000157	Disc

ATTACHMENTS

Change History.xls
Request for Quote Data.xls
Revised Brake Specifications.xls

Buttons: Rotate, Translate, Show, Hide, Zoom Fit, Shaded, Shading & Edges, Transparency

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Procurement & Order Management

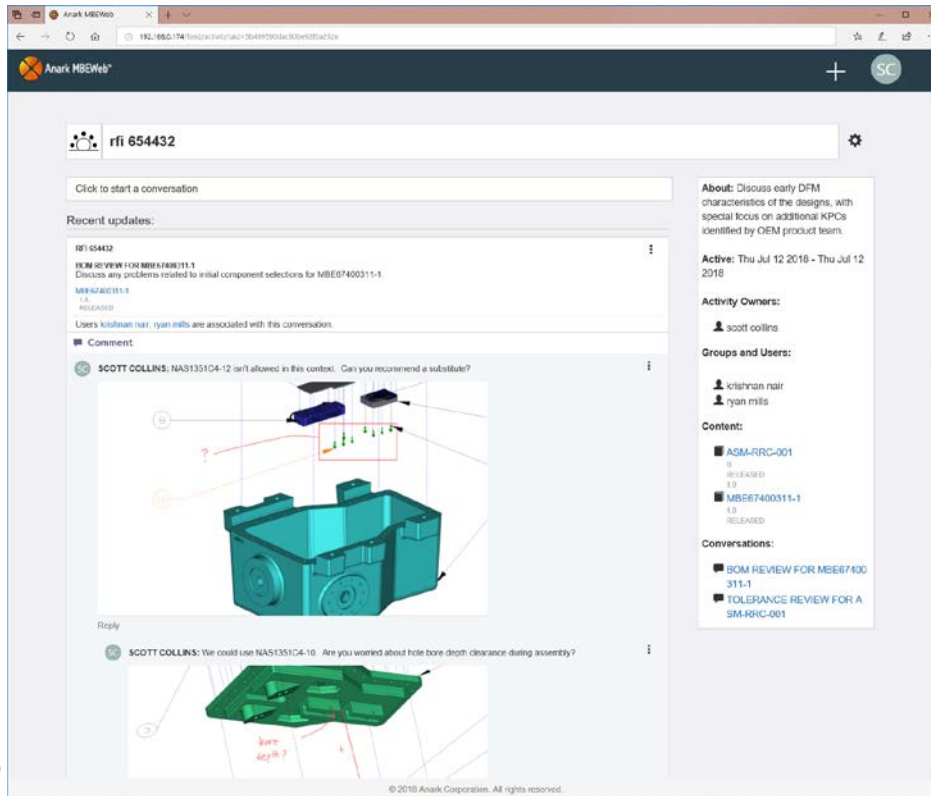


Procurement & Order Management

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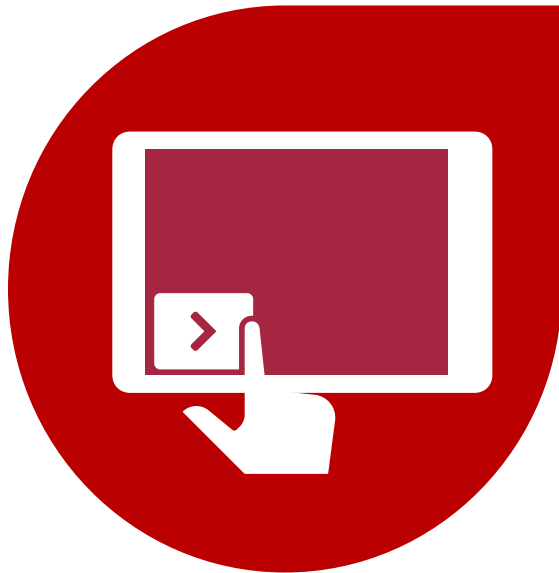


Anark ECM empowers integrated Early Supplier Involvement (ESI) partnerships



- Anark technical data packages more effectively convey product information to suppliers in RFx and ETO bid management processes.
- Anark visual collaboration can significantly drive down product costs by:
 - Solving critical technical problems during product ideation
 - Identifying and reducing supplier capability risks
 - Increasing manufacturing knowledge share
 - Increasing qualified supplier bid participation, with lower bids
 - Reducing product delay risks.





Manufacturing

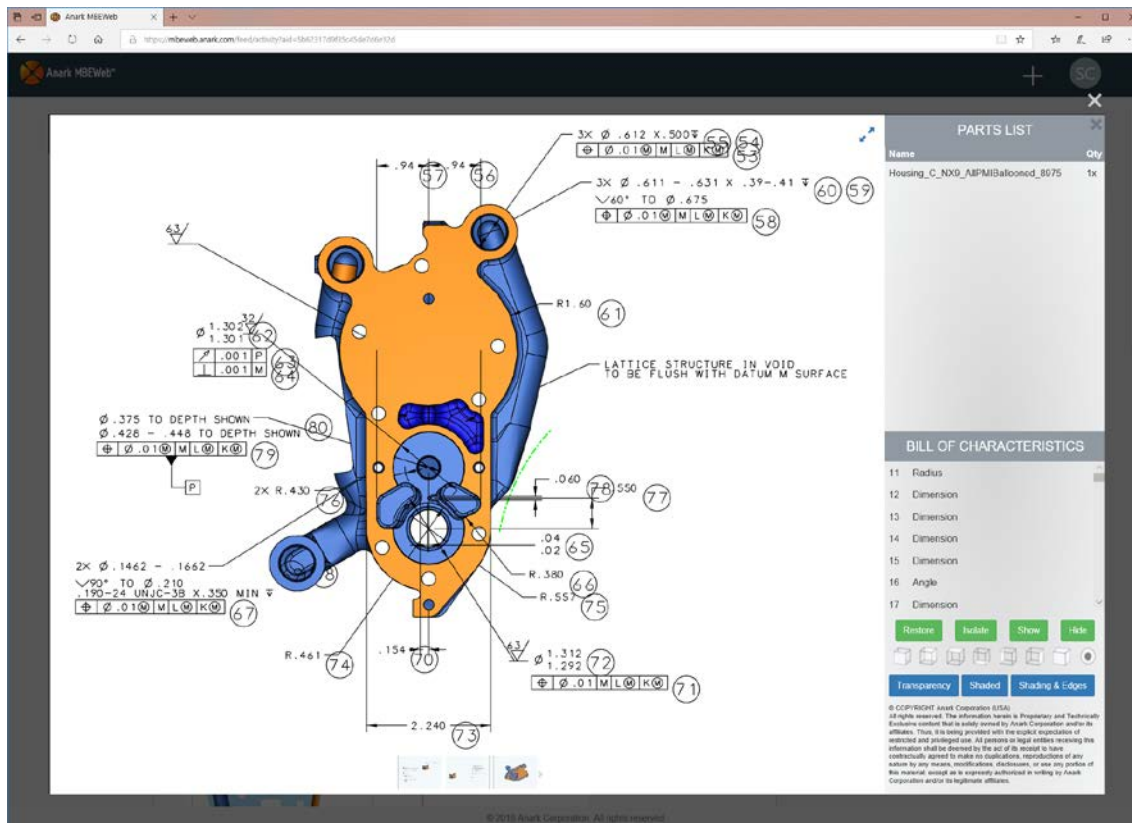


Manufacturing – Work Instructions

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Anark ECM empowers deeper manufacturing visibility



- Anark ECM provides technical collaboration for the factory floor to facilitate problem solving.
- Anark ECM supports process planning and manufacturing work instruction content authoring and publishing automation:
 - mBOM
 - Bill of Process
 - Bill of Resource
 - Routing information
 - Animation (for 3D only)
 - Manufacturing annotations
 - Illustration captures
 - Manufacturing documents
 - Work Instructions

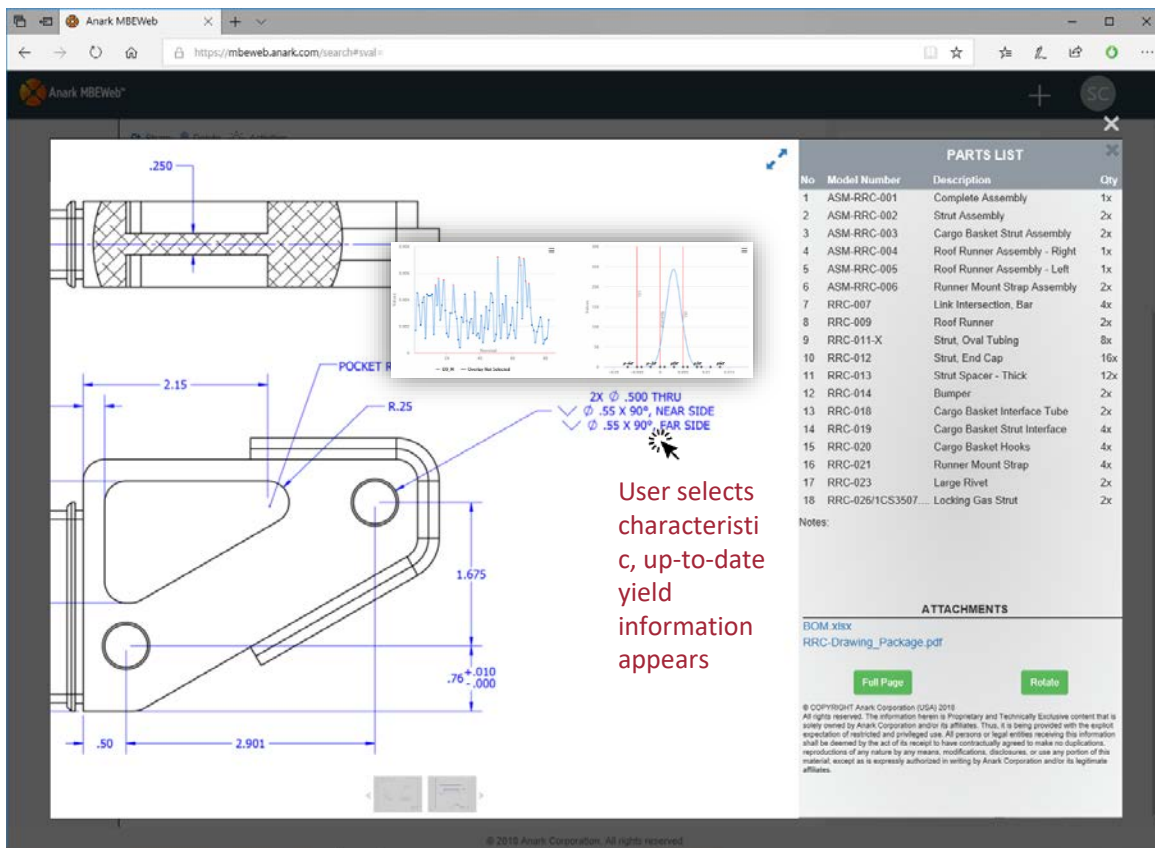


Manufacturing – Quality Inspection

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Anark ECM enables deeper manufacturing visibility



- IOT data can provide real-time feedback directly into smart Anark ECM manufacturing content.
- Anark ECM can leverage QIF with QPIDs to enable quality feedback loops, including process yield information (e.g. from SPC) in manufacturing content, on a per characteristic basis.
- Anark ECM collaboration can generate reports for process feedback, complete with technical context.



Service and Maintenance

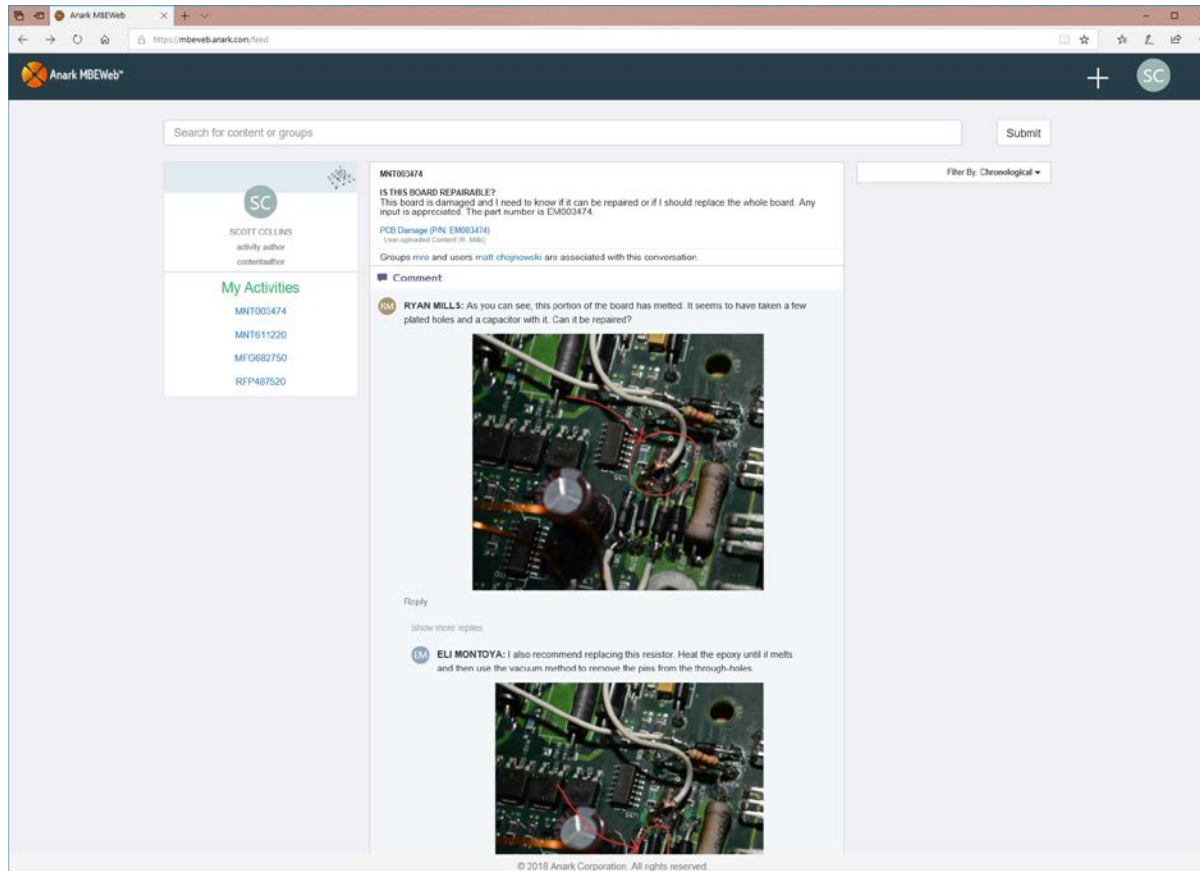


Service and Maintenance

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Anark ECM enables more effective field service



- Anark ECM provides technical collaboration for field service to facilitate problem solving.
- Anark ECM supports maintenance instruction content authoring and publishing automation:
 - sBOM
 - Bill of Process
 - Bill of Resource
 - Animation (for 3D only)
 - Maintenance annotations
 - Illustration captures
 - Maintenance documents
 - Maintenance instructions



Service and Maintenance

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Anark ECM empowers more effective field service

The screenshot displays the Anark MBEWeb interface for a specific maintenance task (mnt611220). The interface includes a sidebar with navigation options like 'Recent up', 'Groups', and 'Comments'. The main content area shows a table of maintenance factors and a detailed description of the task. A red box highlights a 'Baseline Unit' table with the following data:

Baseline Unit	
6	Starts/Week
16	Hours/Start
4	Outage/Year Maintenance
50	Weeks/Year
4800	Hours/Year
300	Starts/Year

Below this table, the text states: 'Baseline Unit Achieves Maintenance Factor = 1'. The interface also includes a 'Figure 22' section with a table of maintenance factors and a 'Figure 23' section with a table of baseline unit data.

- IOT data can provide real-time feedback directly into smart Anark ECM maintenance content.
- Anark ECM collaboration can generate reports for process feedback, complete with technical context.

Conclusions

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- Effective digital transformation strategy is essential to thrive in today's competitive environment.
- By embracing Industry 4.0, Digital Thread, and Model-Based Enterprise (MBE) processes, innovative OEMs and their suppliers will improve efficiency, IP security and quality, and accelerate new product introduction (NPI) timelines.
- Anark's technical ECM platform is uniquely positioned to capitalize on emerging Industry 4.0 & Digital Transformation trends by providing the most effective, flexible, automated tools to empower global OEMs and their suppliers to cost-effectively deploy a connected, information-rich, collaborative Digital Thread.

Thank You

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Come see us in Booth #3