



How to Leverage Model-Based Engineering Data Across Your Supply Chain with Half the Cost (And None of the Fear)

Inside:

- Who Will Be the Winners in Discrete Manufacturing?
- 5 Myths About Connecting Users to the Digital Thread
- Benefits IT Can Deliver Across the Enterprise
- Finding Cost Reduction Opportunities from Hidden Costs

Who Will Be the Winners in Discrete Manufacturing?

While it's never been true that engineering alone can drive a manufacturing company forward, it is widely recognized that connecting people across the value chain to engineering data and the engineers responsible for it can have huge impacts on the bottom line. As a result, engineering now relies on IT more than ever for enabling innovation and performance, reducing costs and ensuring competitiveness.

Consider three important market forces that have thrust IT into a central role in the business of manufacturing:

1) Hyper-focus on risk profiling across supply chains. The pandemic exposed vulnerabilities in supply chains in every industry. As a result, 'supply chain risk' is a hot topic, with everyone from OEMs to governments to start-ups to venture capitalists pouring resources into establishing best practices and solutions for understanding and profiling risk.¹

Manufacturers are now keen to map supply chains and develop a deep risk profile, in order to avoid surprises that lead to disruption.²

Wherever risk is discovered, an immediate demand for better data, transparency and insight follows. The implication for manufacturers is clear: access to data and supplier visibility will be a key requirement for reducing supply chain risk.

2) Continued fragmentation of suppliers. A spin-off of the increased focus on risk reduction is the further fragmentation of supply chains. As OEMs diversify to more regional, multi-site, and multi-source suppliers, greater insight and real-time collaboration among OEMs and suppliers will be the norm.

1) [Getting Ahead of Supply-Chain Risks | McKinsey](#)

2) [Global Supply Chains in a Post-Pandemic World | HBR](#)

3) Manufacturers embracing digitization. The hunger for optimization across the entire value chain (not just the supply chain) creates a pull for technologies like AI and IoT to find their way into manufacturing. The 'digital thread' in manufacturing supply chains is simply a component of the broader, wider movement of technology permeating every corner of the business.

These factors now mean you can no longer talk about supply chains without talking about data, and how to make it accessible and sharable at scale.

This makes IT leadership indispensable to success. Yet data is merely the beginning of the story, the table stakes in the new normal.

IT'S UP TO ENGINEERING & IT TO TAKE MANUFACTURING FURTHER

COLLABORATE IN HIGH FIDELITY

High fidelity engineering data includes all required, technically accurate product manufacturing information (PMI); including (but not limited to) GD&T, component level materials, assembly level BOMs, and configuration specifications.

The winners in discrete manufacturing will be those organizations who can figure out how to easily (and securely) share high fidelity engineering data and insight with everyone across the supply chain, so that higher quality products can be delivered faster, with lower costs.

To boil this down to one word, "collaboration" is the key to the future.

But while that's true, even collaboration isn't the full story. Rather, contextual collaboration is the key requirement for success in discrete manufacturing. It's about giving people access to data, and allowing them to communicate on their work together in real time without relying on extraneous apps, disconnected files, and rogue workflows.

Enabling contextual collaboration across the supply chain is how manufacturers will win.

The Good News: It's Not Impossible – It's Not Even Difficult – to Publish and Securely Share Technical Data with Everyone

IT Directors have a great opportunity to develop these essential competencies, not only to support the business, but to support their manufacturing CIOs who are facing “monumental” challenges today.³

Fortunately for IT Directors, solutions for securely sharing engineering data already exist, and are widely proven. In other words, there are no technical barriers to making this happen.

On the contrary, the biggest barriers today are, in fact, psychological. You can test the validity of this statement for yourself.

Imagine that you're at your desk, ready to start your workday, when you hear that a new company priority has been announced – and you're the person who will be charged with making it happen. Your challenge is:

Take all of our company's complex, technical, engineering data and securely share it to non-technical, non-expert users in the company and throughout the supply chain. Make sure this facilitates improved communication and collaboration in real-time.

This challenge will find its way onto every manufacturing IT Director's to-do list.

What would be your first step after reading this?

3) [The Top 5 Challenges for CIOs in 2021 | Manufacturing Global](#)

If you're like most people, you might feel your mind go into overdrive as you start envisioning extended process overhauls, massive change management obstacles, and a multi-year timeline.

All of this might send you into a state of reluctance, hesitancy, or even fear.

Of course, any of these reactions would be perfectly normal, based on common assumptions about how hard it is to take complex technical data and securely share it across the organization (and beyond) for both technical and non-expert users.

However, common assumptions about connecting users to the digital thread are mostly myths.

If you were charged with the challenge above, the first thing you would need to do, to give yourself every chance of coming through for your organization, would be to identify the myths that are likely to hold you back, and then deal in reality – as we do next.

Myth #1: “It will be difficult for us to get started, because we don’t have a fully mature model-based enterprise approach in place.”

Reality: You don’t need one. It’s common to assume that connecting all users to the digital thread requires a fully mature model-based enterprise strategy but it does not. Research shows that strategies leveraging a minimally annotated 3D model combined with other product data are the most successful at reducing engineering change orders (ECO).⁴

Value can be achieved by simply sharing 3D and 2D visuals along with other existing documentation in technical data packages (TDPs).

How? By automating the publishing and sharing of file-less CAD and non-CAD content, giving everyone who needs it access to the latest, officially-released models and data as a secure snapshot of federated information at that point and time

Keep reading for links to real-world examples where this is true.

4) [The ROI of MBD | Lifecycle Insights](#)

Myth #2: “Our ecosystem is too unique. Publishing and sharing our technical data would require a lot of work.”

Reality: The uniqueness of your operation does not preclude you from automation and sharing at scale. A digital thread does not have to be a complex web of every system and software piece you own. In practice, most companies actually do not want this.

Instead, they want a simplified, elegant solution for connecting people to data they've never been able to access before. This can be your goal.

Today's best TDP publishing systems do all the hard work for you. In fact, you don't even need your data all in the same place. Modern content collaboration platforms can:

- fetch a combination of high fidelity multi-CAD and non-CAD data for you from any number of systems;
- run recipes against the data to produce a tailored view of information that combines all of that disparate data into a single, easy-to-consume data package; and
- deliver TDPs to any device anywhere via 3D PDF and file-less web content, requiring only a web browser, not specialized tools.

Myth #3: “We’ve already solved this. Our current solution for sharing data and collaborating works fine for our purposes.”

Reality: Going purely on odds, it's almost a certainty that your existing solution has gaps in it that you're not aware of. Files are being shared in ways that go against your own policies. Data is missing. Information exists in someone's hard drive, or email inbox, and nowhere else. And there are numerous systems designed to work together in ways that only a handful of people truly understand.

This is not a blind guess about your environment but a sound hypothesis, based on over two-hundred discovery and assessments of discrete manufacturing operations spanning 15 years. In that time period, we've found that big discrepancies between how solutions are built versus how they're actually being used occur 82% of the time.

Myth #4: “This won’t be easy for us. We have unique security requirements.”

Reality: Some of the most security-conscious companies and government organizations in the world are already safely sharing technical data across their supply chains.

They use security-focused platforms that produce highly secure file-less content and dynamically apply session-aware watermarking to all sensitive data.

SECURITY CONCERNS?

Read more about security in depth [here](#).

Myth #5: “The disruption will be too severe. We can’t prioritize an engineering process change, or a multi-year rollout of an IT system change.”

Reality: Predictions about the impact on existing processes, or the amount of time that a project “of this magnitude” will take are usually overstated. That’s because it’s difficult to make accurate predictions without the influence of unconscious bias from past initiatives that appear similar because they i) involved complex data, ii) involved multiple stakeholders, or iii) had been tried before but didn’t quite work

The antidote to this bias? Collect examples of other solutions in action, so you can reframe your predictions and make them realistic. Below are links to two examples of real-world deployments where timelines and disruption were minimal.

Transforming GE Power’s Digital Supply Chain [Watch the Video](#)
with Kena Yokoyama, Engineering Manager for Product Definition

Realizing Manufacturing Digital Thread Value [Watch the Video](#)
with Craig Halterman, CIO of Cohu

When you can cast aside these myths for what they are, what you’re left with is a fresh path forward and the mental space to evaluate new ways to solve an old problem.

IT Directors: You Can Introduce and Deliver Upside All Across Your Ecosystem

The upside of seamlessly connecting people and technical data to the digital thread is far-reaching. Here are the proven outcomes IT can expect to champion and deliver for supply chain, manufacturing and field service.

IT CAN CHAMPION BENEFITS ACROSS THE ENTERPRISE AND BEYOND

Secure, efficient integration and collaboration with suppliers and OEMs

- Securely manage supplier collaboration from early activities through to production.
- Improve sourcing, supplier efficiency, responsiveness, and quality.
- Provide time-limited access to digitally released documents and technical content for everyone from procurement to suppliers.
- Collaborate across teams with real-time activities-based chat and markup tools.

Manufacturing Process Clarity with Tactical Plan

- Digitally release graphical-content-rich work instructions and quality plan execution associated with MRP/MES work orders, for manufacturing in house or with external suppliers.
- Author any type of technical content into digital work instructions, providing work clarity to operators with quality plan execution on a per-serial-number basis.

Field-Service Connection to the Digital Thread

- Securely distribute graphical, content rich service instructions and quality plans associated with CMMS work orders, for maintenance task execution in the field.
- Mobile access to digitally released technical content with graphical markup and collaboration allows field technicians to solve problems quickly.

Engineering Teams Focused on What Matters Most: Innovative Products

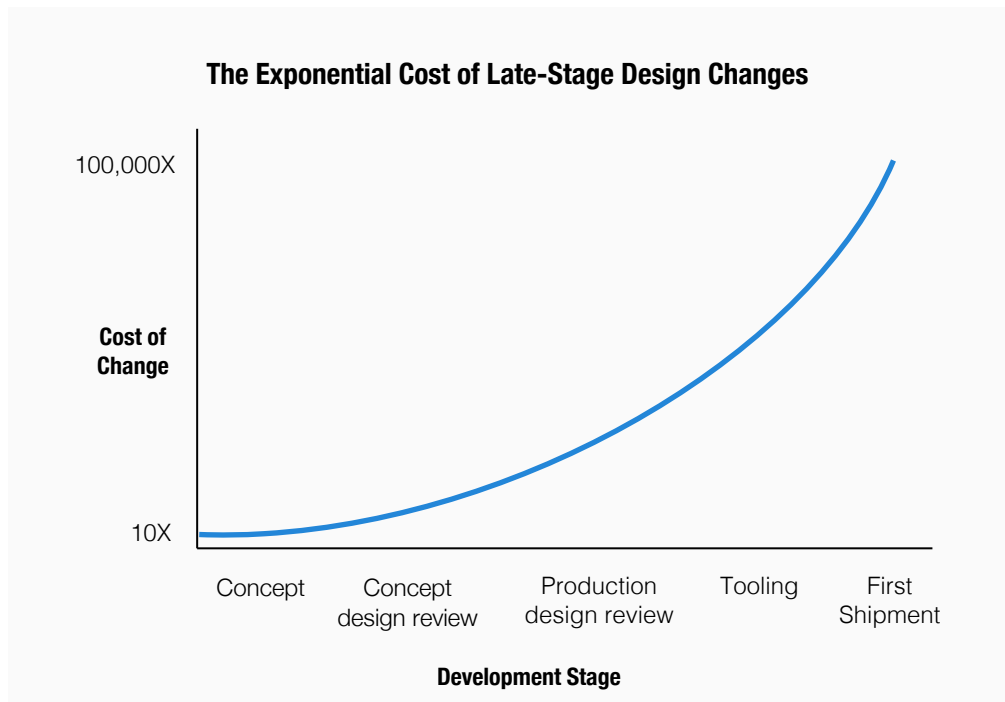
- Stop spending time producing a variety of shareable engineering data assets, and start focusing on innovative products and hitting release targets.
- Deliver MBD value across the value chain without adding to engineering workload.
- Collaborate on questions about your design in the context of your design.

Finding Cost Reduction Opportunities Through Identifying Hidden Costs

COST SAVINGS FROM AVOIDING LATE-STAGE CHANGES

Today, the tolerance for costs from rework and late-stage changes to design is rapidly decreasing. The reason? It's easier now to put solutions in place that eliminate errors in decision making due to conditions such as: poor communication, lack of context in collaboration, data stored in disparate locations, and gaps in competencies among users and interpreters of engineering data and expert technical applications.

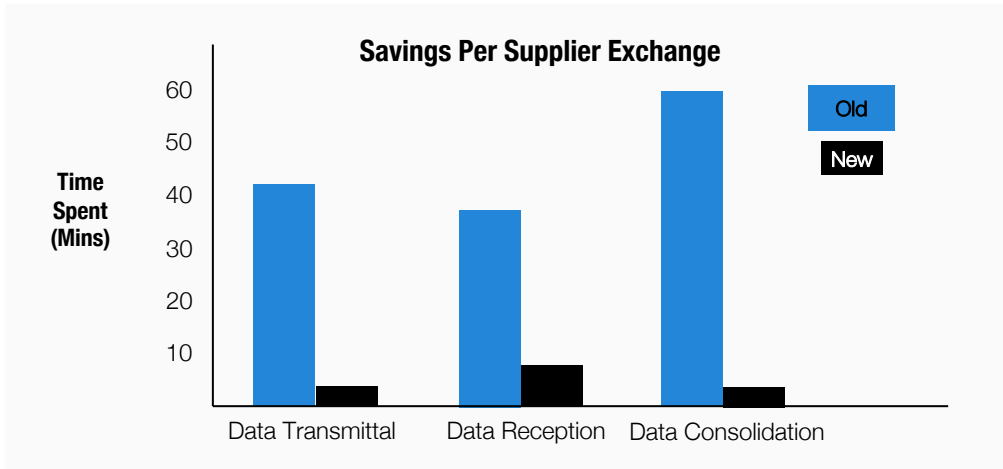
The de facto example of exponential cost increase as you proceed through the development stages is the now famous example of General Motors' 2014 recall of their faulty ignition switch. The cost for getting the switch designed right in the first place would have been 57 cents. As of Feb 4, 2015, the total cost of the recall had surpassed \$4 billion.



GM's faulty ignition switch recall of 2014 exemplified the exponential cost curve phenomenon to the letter. A design error in a 57-cent switch incurred recall costs of \$4.1 billion.

COST SAVINGS FROM TIME SAVINGS IN SUPPLIER COLLABORATION

There are also significant cost savings achievable with improved data exchange and handling times when collaborating with suppliers and/or contract manufacturers.



For this Anark customer, supplier interaction time was reduced by 90%, on average, by automating early supplier collaboration with 3D TDPs.

COST SAVINGS FROM MODEL-BASED DIGITAL WORK

Companies that leverage engineering data downstream with manufacturing, suppliers and field service see substantial returns. Scrap and rework are minimized. Production processes across the supply chain are streamlined. And everyone wins.

3D TDP Based Collaboration vs. 2D

Commodity	Annual Funding	Savings (%)	Savings (\$)
Part Fabrication	\$ 10,000K	30%	\$ 3,000K
Assembly	\$ 2,000K	10%	\$ 200K
QA	\$ 2,000K	10%	\$ 200K

Total Savings: \$ 3,400K

Model-Based Digital Work Instructions

Instructions	Units	Cost/Unit	Scrap	Scrap Cost
MBWI	261	\$ 105K	0%	0
2D	261	\$ 105K	15%	\$ 4,095K

Total Cost Avoidance: \$ 4,095K

THE VALUE OF QUALITY IMPROVEMENTS

With cost of quality equivalent to 10% – 40% of annual revenue, a \$160M mid-market company that improves quality by 5% can see gains ranging from \$640K – \$1.2M. A \$4B enterprise with a 5% improvement can see gains ranging from \$2M – \$30M.

Implications of Delays and the ‘Do Nothing’ Approach

Even with the pressure of external forces and the accessibility of available solutions like [Anark’s product suite](#), solutions don’t start without individual initiative. Some IT Directors will delay or hesitate to make change. Here are the implications of taking a delayed or ‘do nothing’ approach.

INACTION AND DELAY COMES AT A COST

Fractured mini-networks. There will be an increasing divide, and knowledge gap, between those who use ERP, PLM and other specialized platforms as part of their daily routine, and others who don’t. The latter group will be out of the loop, resulting in questions, indecision, and communication breakdown.

Drain on innovation. More time than necessary will be spent on low-level problem solving of issues that could be avoided or addressed with better collaboration and access to data and insight. This will divert attention and resources away from exploration and innovation. Ultimately, the customer experience and competitiveness will suffer.

Loss of key clients and market share. Every organization needs to understand the cost of delays (CoD) and how to optimize your product development processes to reduce CoD. Cost of delay represents the economic impact of a delay in project delivery. Left unchecked, these delays can easily result in millions of dollars in lost revenue.

Higher costs. Manufacturers who don’t embrace the opportunity ahead will operate at a cost disadvantage compared to rivals who have connected their users to the digital thread.

Final Thoughts: Trust a Proven Leader

When it comes to securely publishing and sharing engineering data, no other solution provider matches Anark's depth of expertise and track record for delivering customer value.

This expertise combines a deep understanding of publishing and sharing MBD and other information-rich data – with a focus on user experience that makes it easy for everyone to collaborate in context.

What's more, no other company offers the kind of truly contextual collaboration that discrete manufacturers need to resolve issues early in the development process and succeed in a hyper-competitive, ever-changing marketplace.

[Contact Anark](#) to book a no-obligation consultation with a solution expert, or visit our [resource library](#) for manufacturers, to learn more about how we can help.

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