



eBook

# Mastering Complex Product Development Challenges Through Digital Transformation

Customer Cases Leading the Way



## EFFECTIVE USE OF PRODUCT DATA

Creating an enterprise ecosystem for companies that design, build, and operate complex products that can handle change (regulatory, business model, market) requires the ability to develop new ways of thinking, connecting, and collaborating to solve your complex business challenges—think traceable and sustainable product design, shifting to product as a service, collaborative supply chain and mitigation—all of which need access to, and a complete rethink of a precious and often misunderstood and untapped resource—product data.

The critical differentiator in successful enterprise ecosystems is the efficient and effective use of product data—not just what you create within your four walls—it is product data generated across the product lifecycle from suppliers, competitors, and customers. If you want your extended enterprise ecosystem to be resilient and adapt to constantly changing market and business dynamics, now is the time to make it a strategic initiative.

Most organizations think it's simply about connecting siloed data. The reality is that a successful digital transformation requires new processes and the flexibility to disrupt standard operating procedures, letting go of comfortable yet outdated tools, and determining the necessary level of connectivity based on the use case—and these are without limit.

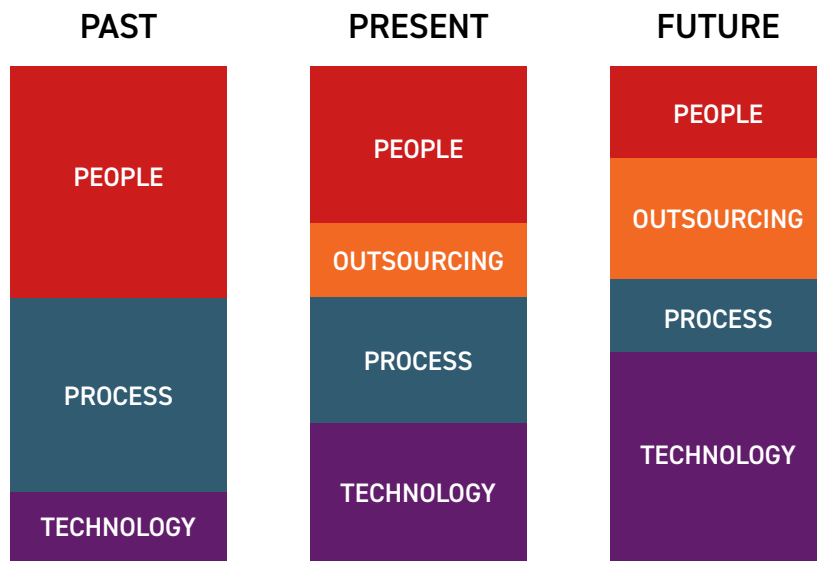
But don't take our word for it! A recent market research study on the Digital Thread by CIMdata provides insight into what this connectivity should do to support digital transformation—the bottom line is traceability across multiple domains with meaningful relationships. (see page 6 for more insights).



## WE ARE AT THE “NEXT” DIGITAL TRANSFORMATION TIPPING POINT

There is always a need to delicately balance people, processes, and technology to run your business. As your organization has evolved, new opportunities to incorporate better processes or new technologies create efficiencies that shift the balance between the three.

So, as we consider the next phase in transformation—supporting complex use cases—we must realize that to solve these effectively for the long run, we must rebalance our approach. According to the Bain “[Engineering, Research, and Development Report](#),” talent gaps are emerging as Baby Boomers retire; there is no doubt that the people, processes, and technologies used to support complex use cases today must shift to adapt to the knowledge loss.



### The Digital Transformation Balancing Act

Trends are clear. To address the talent gap, investments in digital engineering technology, automation, and outsourcing are required to support next level product innovation.

# 73%

of engineering and R&D focused companies report talent gaps. That divide will widen as baby boomers retire.

# 60%

of engineering executives plan to increase outsourcing over the next three years as they seek to innovate faster amid a talent shortage.

Executives expect spending on engineering and R&D to rise

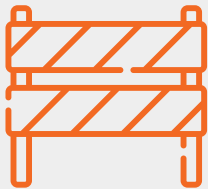
# 10%/year

from 2022 to 2026 fueled by investments in digital engineering.

## WHAT IS HOLDING YOU BACK?

This transition will be a challenge—with lots of evolving change. To get momentum going with your unique transformation objectives, you will need the ability to articulate project goals, your belief in them, and how these projects benefit customers, the organization, and you and your team. Most projects fail for one big reason—a lack of communication with executive leadership that links the project to business objectives.

### OBSTACLE #1



#### Process and technology are killing your business

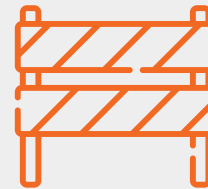
Inefficient, error-prone processes increasingly create a disconnect between data and people. Often companies try to patch this with new technologies, leading to constantly changing the IT application landscape which never solves the problem.

#### SOLUTION

##### Understand the technology landscape and processes

According to CIMdata's Report "Deferred PLM Modernization Delays Time to Value" the over customization of OOTB solutions, **can cost over \$1M, and take one year to upgrade.**

### OBSTACLE #2



#### Organizations are not aligned to what must change

Projects look good "on paper," and appear to improve the business, but there is not enough justification to move forward because you lack a deep understanding of the significant change required to be successful.

#### SOLUTION

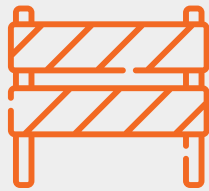
##### Break up big projects through iterations and adaptation

According to Gartner, "...digital transformation initiatives will take large traditional enterprises, on average, **twice as long and cost twice as much** as anticipated."

*"Gartner research indicates that 81% of organizations are seeing an increase in the involvement of business technologists in innovation."*

Source:  
2022 Gartner Distributed Technology  
Innovation Management Survey

### OBSTACLE #3



#### Inability to communicate in business terms

It's hard to get a project up and running because it's often difficult to verbalize the full range of benefits to customers, the organization, and your team. More than likely, this results from having these projects primarily led by IT. To be successful, the approach to digital transformation initiatives should shift to a business-centric approach.

### SOLUTION

Move from IT centric...

THE OBSTACLE	APPLICATION	ISSUE	ADDRESSES	RESULTS
What does it do?	Advanced product quality and control	Problems with quality	Workforce inefficiencies	Time savings

...to business centric.

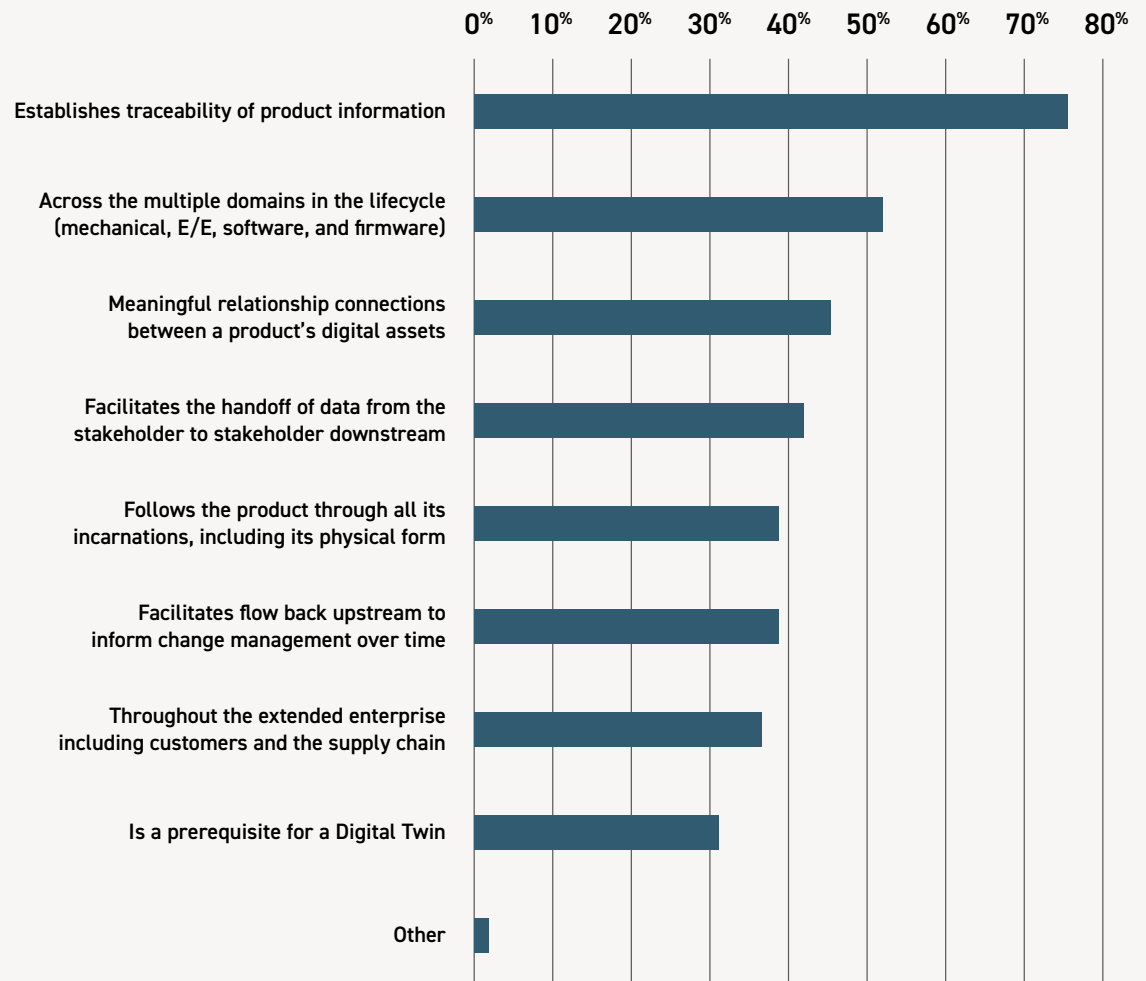
THE OBSTACLE	THE WAY	THE RISK	THE IMPACT	THE RESULT
What does it do?	Enterprise change management	Customer and financial risk	Sales decline, cost inefficiencies	Improved customer experience

## DIGITAL THREAD WILL BE THE CONNECTIVE TISSUE TO TRANSFORMATION

The workhorse of your transformation will be the Digital Thread. Recently, CIMdata released a report on the Digital Thread in Aerospace and Defense—but the results apply to any industry. One important takeaway is that there is no generally accepted definition of the Digital Thread, which Aras couldn't agree more with! Why? Each organization is unique; this uniqueness is their competitive advantage, so why would they try to create a digital thread to fit an industry standard?

Another important result of their research provides guidance on the Digital Thread's important characteristics. See the chart below on what these are and using them to help create the boundaries you need to support your transformation goals to solve your unique business challenges.

### What the Digital Thread Does



[Recent survey from Digital Thread in Aerospace & Defense: Poised for Rapid Growth](#)

## THE VALUE OF A CONNECTED ECOSYSTEM TO SUPPORT COMPLEX USE CASES

Do you want to know what makes people move from resistant to resilient? Making product and organizational data and its status available to the right people at the right time. According to Accenture's, "[Think thread first: Surf the wave of product data](#)," companies that have integrated the data supporting a product's lifecycle create the following operational efficiencies:

**20%-40%**

reduction in costs for data duplication  
and overlapping toolsets

Up to **5x**

the speed of data capture and  
curation through thread automation

**2-3x**

data reuse through  
cross-functional access to data

**15-40%**

improvement in time to market via  
enhanced design team coordination

**10-50%**

reduction in product renovation activities  
through data-driven design

## EXAMPLES OF TRANSFORMATION

Digitally transforming into a resilient enterprise ecosystem requires a new way of thinking. In some cases, this means migrating to a better way of operating, thinking differently about how you deliver complex products, or shifting to new markets.

**See how others have done this using product data to make the move.**

Creating a Digital Twin  
for Traceability of Small  
Nuclear Reactors



NuScale is taking a whole new approach to nuclear power. Instead of building reactors on-site, they have designed a small modular reactor (SMR) which is built and assembled in a factory and then transported to the site for final installation.

NuScale selected a solution that could bring groups together across the product lifecycle to support a continuous digital thread, ultimately creating a digital twin so that product information can be linked to support customer requirements and compliance needs.

*"With Aras we believe we will realize the benefits of the digital thread sooner, at lower cost, with a platform that can transform with NuScale. The unique architecture easily adapts to meet the changing processes and business requirements of our company and industry. Customization is not only allowed, but encouraged, with solutions tailored to our needs, rather than tailoring our processes to the software."*

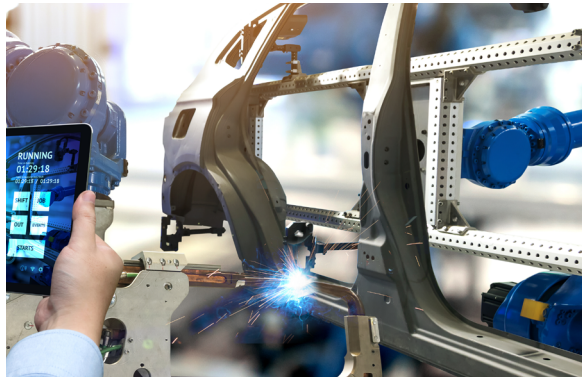
- Neil Olivier, director of Corporate Services, NuScale





A Digital Thread  
of the Product  
Development Process

## KENDRION



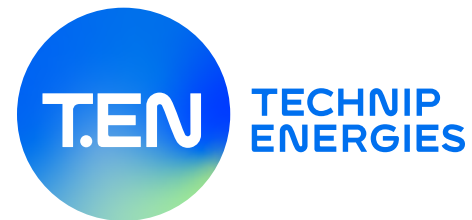
Kendrion was managing multiple systems across three divisions, one of which was approaching its end of life. Previous acquisitions added tools and processes that needed to be integrated.

To digitally transform, Kendrion sought a single product lifecycle management (PLM) environment to implement a digital thread that facilitates traceability throughout the product development process. This will enable the mapping of requirements to engineering, increase reuse of information, reduce dependency on manual spreadsheet-based processes, and enhance visibility of all product information.

Technip Energies, a leading engineering and technology company, required a platform to advance its energy transition strategy to achieve full data-centric deployment of its project methods and tools.

Their digital-by-design approach aims to achieve full project lifecycle traceability and optimization from concept through design, execution, and operations. This collaboration will increase efficiency and create new opportunities in the energy industry.

The solution will be a single project platform, leading to standardized data flows and seamless collaboration between disciplines and easy access to past project information to increase engineering reuse, reduce cycle time, data integration for actionable reporting, and creation of a digital twin backbone.



Transitioning Business  
Model to Green Energy  
Product Lifecycle  
Development



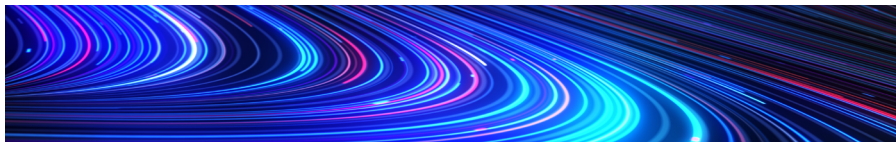
Moving to a Software  
Defined Vehicle

## Nissan Motor Company

**Nissan Motor Co., Ltd** is a car manufacturer that designs, manufactures, and sells cars globally. To ensure long-term competitiveness in the market driven by the electrification of cars, the company established a business transformation plan, "NISSAN NEXT," with the goal of full implementation by 2023.

They adopted Aras Innovator® as the development platform for their electronic control systems. Nissan's success in streamlining configuration management was made easy by Aras Innovator's 'easy to build,' 'easy to align,' and 'easy to connect' characteristics.

Aras Innovator contributed to efficiently managing complex in-vehicle software variants between Nissan Motor and its alliance partners. With Aras, Nissan has realized the benefits of integrating with its alliance partners, and constructing a digital thread is becoming a reality.



The company, founded in 2010 in Tampere, Finland, has grown exponentially over the years. The main reason is their product's unique selling point—in addition to purchasing and owning, it is also possible to implement an Air-as-a-Service business model—the customer only pays for the compressed air they use with no need for capital investment.

As the company grew, structures became more complex, as did the file structure on the server. Data was becoming more difficult to locate, with employees uncertain they were using the latest version. This is a classic example of a lack of transparency and data loss, a problem that is estimated to cost millions of dollars in lost revenue each year.

Today at **Tamturbo**, nearly all employees work with Aras Innovator. They trust their data. It is stored in one place and not lying around somewhere else. The knowledge is visible to everyone in the company and easy to retrieve. This saves a lot of time—and a lot of money.

# Tamturbo

Changing the  
Business Model to  
Product-as-a-Service

## ARE YOU READY TO SOLVE YOUR COMPLEX USE CASES?

To understand if you have the right solutions in place to solve increasingly complex product requirements, compliance standards, or changing business models, ask yourself six questions. If you answer 'no' to any of these—it's time to break free from the technology and processes that are holding you back:

YES	NO		
<input type="checkbox"/>	<input type="checkbox"/>	<b>Is your platform customizable? Once customized, can you upgrade easily and without data loss?</b>	Look for a platform with underlying technology that is flexible, scalable, and upgradeable—even when heavily customized.
<input type="checkbox"/>	<input type="checkbox"/>	<b>Does your platform enable the creation of an end-to-end graphically visible, digital thread?</b>	It is critical that solutions sustainably connect data throughout the entire lifecycle—breaking down information silos and fostering collaboration.
<input type="checkbox"/>	<input type="checkbox"/>	<b>Does your platform give you the flexibility to meet process requirements that don't exist today?</b>	Out-of-the-box software may be able to meet today's needs, but the digital processes of tomorrow don't exist yet. Solutions should offer flexible customization to meet ever-changing needs without sacrificing upgradeability.
<input type="checkbox"/>	<input type="checkbox"/>	<b>Does your platform give you total data transparency?</b>	It's your data, you should own it instead of leaving it captive to aging technology or a vendor's native software.
<input type="checkbox"/>	<input type="checkbox"/>	<b>Does your platform provider try to make you fit their single deployment model?</b>	There should be choices when it comes to deployment. On-site, in a data center, in the cloud, or a combination for a hybrid deployment. Whatever works best for you!
<input type="checkbox"/>	<input type="checkbox"/>	<b>Can your platform evolve technically—for example to SaaS?</b>	Solutions should evolve over time and adapt to new and improved technology, and better scaling—without extensive redesign efforts.

## THE RESILIENT PLATFORM SOLUTION

There are fundamental technology building blocks required to maximize business resilience with your digital transformation efforts.

### DATA TRANSPARENCY

An open platform allows organizations to own their data instead of leaving it captive to an aging technology or a software vendor.

### BUSINESS PROCESS ADAPTABILITY

Business processes will not only change but will do so often, quickly, and without concern for the ability of the systems to change with them. A resilient platform needs to be so adaptable that it not only supports change, but also encourages it.

### EVOLVING TECHNOLOGIES

A platform should never be locked into a technology. For a platform to be continually relevant over time, there must be flexibility in the design by keeping to open standards.

### SYSTEM CUSTOMIZATIONS

Since every company is unique and every business process evolves, a platform must be able to implement customizations without impacting future upgrades or creating crippling technical debt.


The bottom line is if your technology is not **(1) transparent**—as technology changes, the data inside the technology does not, **(2) evolvable**—solution selection doesn't lock you into one specific technology and, **(3) adaptable**—supporting and embracing constant change, it will take too long to break your out of your old and outdated business model.

## READY TO SOLVE YOUR COMPLEX USE CASES?

Get started by downloading

**Build with Aras:**  
**Adapt Quickly to Stay Ahead of Unknown Business Risks**





Aras provides the most powerful low-code platform with applications to design, build, and operate complex products. Our technology enables the rapid delivery of flexible, upgradeable solutions that build business resilience. Aras' platform and product lifecycle management applications connect users in all disciplines and functions to critical product data and processes across the lifecycle and throughout the extended supply chain. Airbus, Audi, DENSO, Honda, Kawasaki, Microsoft, Mitsubishi, and Nissan are using the platform to manage complex change and traceability. Visit [www.aras.com](http://www.aras.com) to learn more and follow us on [X](#) and [LinkedIn](#).

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