

Digital Twins: The PLM Economy Perspective

2024 Market & Industry Forum—11 April 2024

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Digital Twins: The PLM Economy Perspective
PLM Market & Industry Forum
A CIMdata PLM Leadership Event

11 April 2024—Frankfurt, GERMANY

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Strategic management consulting for competitive advantage in global markets

The leading independent authority on PLM and its digital transformation. We provide research, education, and strategic consulting to clients around the world.

OUR MISSION:
Maximizing clients' ability to design, acquire, deliver, and support innovative products and services.

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Key Takeaways



Digital Twins: The PLM Economy Perspective

- Software and service providers have a (mostly) high opinion of their customers digital twin status and plans
- They have a lot to offer and are likely projecting that on their “typical customer”
- Overestimating adoption but often consistent with the industrial respondents on the future
- Customers are much more pragmatic around the digital thread
- Consistent views on key technologies and constraints but not on expected benefits

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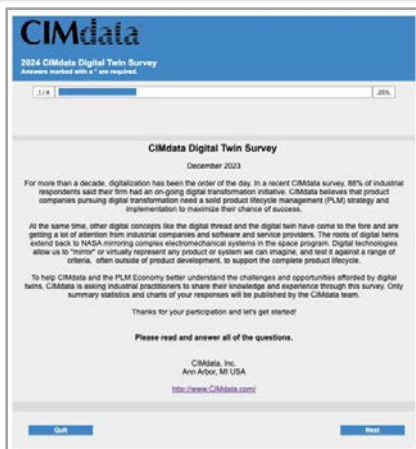
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Initiated CIMdata Research



Built on previous research and knowledge of the PLM Economy offerings




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- CIMdata opened two surveys on digital twins
- One for **industrial respondents**
 - The ideal respondent is knowledgeable about digital transformation, digital thread, and digital twin activities
- One for **software and service providers** enabling digital thread and digital twin capabilities

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The PLM Economy Survey


 Targeted to software and services companies

- Repurposed many of the questions and themes from the industrial survey, asked from perspective of the software and services companies in the PLM Economy
- Respondents asked to answer for their “typical” customer
 - Do they “know” this customer?
- Want to know what the PLM Economy respondents think
- How does it line up with our industrial respondents?
 - CIMdata, ISVs, and SI/Reseller/VARs have a “pro-innovation bias”
 - Shows in the survey responses

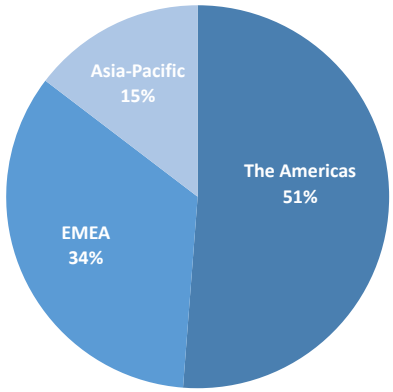
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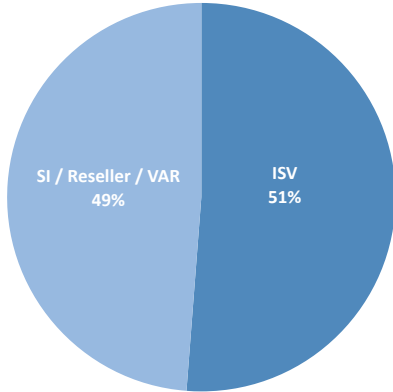
Respondent Demographics

 Not quite 40-40-20 either, evenly split between ISVs and SI/Reseller/VAR

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Region	Percentage
The Americas	51%
EMEA	34%
Asia-Pacific	15%



Respondent Type	Percentage
SI / Reseller / VAR	49%
ISV	51%

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Responding Companies Included

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Companies represent over 25% of CIMdata's PLM market estimate

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- Capgemini
- Dassault Systèmes
- DATADVANCE
- FASOTEC
- Fujitsu
- Hexagon
- Intercax
- Modelon
- PTC
- Razorleaf
- SAP
- Siemens
- Twinsight Consulting
- Vias3D

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Model-Based Practices Adoption

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Interest and adoption of the "typical" customer

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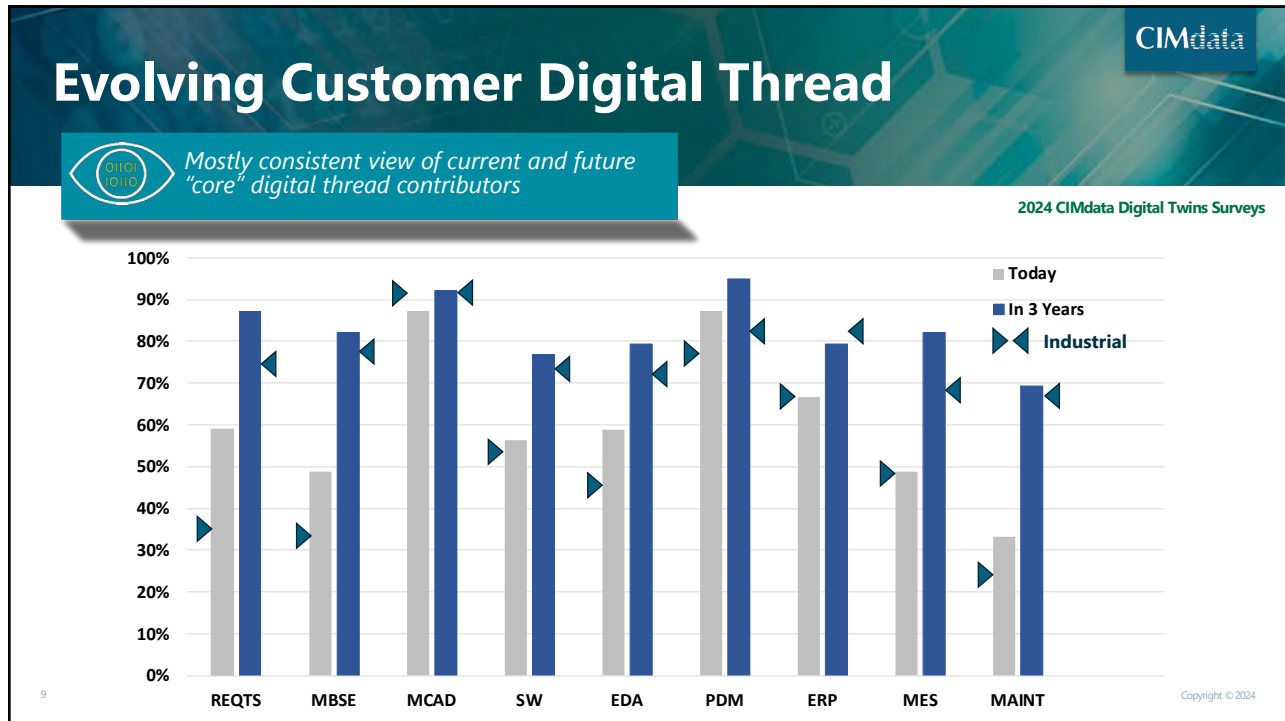
Practice	Not Using	Considering	Piloting	Implementing	In Production	Industrial Benchmark
Model-Based Definition	~5%	~10%	~15%	~45%	~25%	~40%
Model-Based Enterprise	~5%	~10%	~25%	~30%	~20%	~10%
Model-Based Systems Engineering	~5%	~10%	~25%	~20%	~30%	~15%

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CIMdata Foresight Poll

What other types of software offerings will contribute information to your typical customer's digital thread? Please enter one.


What other types of software offerings will contribute information to your typical customer's digital thread? Please enter one.

Nobody has responded yet.
Hang tight! Responses are coming in.


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Other Digital Thread Contributors

 *Typical customers digital thread – really advanced customers (1 of 4)*


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- Application Lifecycle Management (ALM)
- Software management
- Supply chain (inbound and outbound, sourcing)
- CAE
- Reliability, Availability, Maintainability and Safety (RAMS)
- Content management systems
- Customer Relationship Management (CRM)
- Cameo
 - AI/ML
 - Specific AI (model as a service) service models and algorithms
- Supply chain collaboration
- Work instruction (authoring)

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Other Digital Thread Contributors

 *Typical customers digital thread – really advanced customers (2 of 4)*


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- Quality and Inspection planning tools
- CAE/Simulation/SPDM
 - Manufacturing simulations
 - Engineering simulations
- Integration platforms
- Analytics and Edge
- Virtual/digital twins
- AI-enabled MBSE updates
- Model-based acquisition
- Model governance
- Network scans
- Hypervisors for cyber designs
- Digital mission engineering
- IoT & C2 Operational Systems


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Other Digital Thread Contributors

 *Typical customers digital thread – really advanced customers (3 of 4)*


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- Manufacturing process planning
- Digital shopfloor solutions
- Disposal information
- Engineering process integration platform
- Quality control data: metrology, NDT, etc.
- Project management
- IIoT and AR
- Service Lifecycle Management
 - Asset management
 - Spare parts and planning
- Quality management
- Regulatory compliance
- Certification
- Consumer sensory data

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Other Digital Thread Contributors

 *Typical customers digital thread – really advanced customers (4 of 4)*

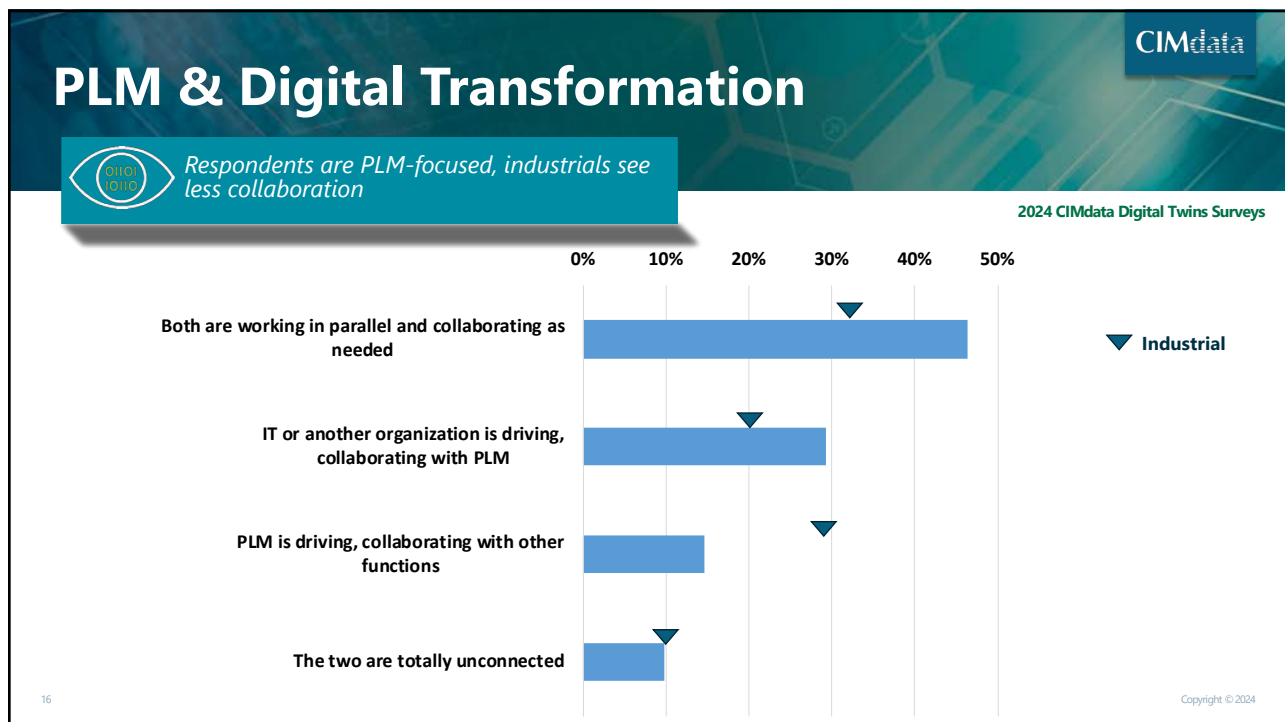
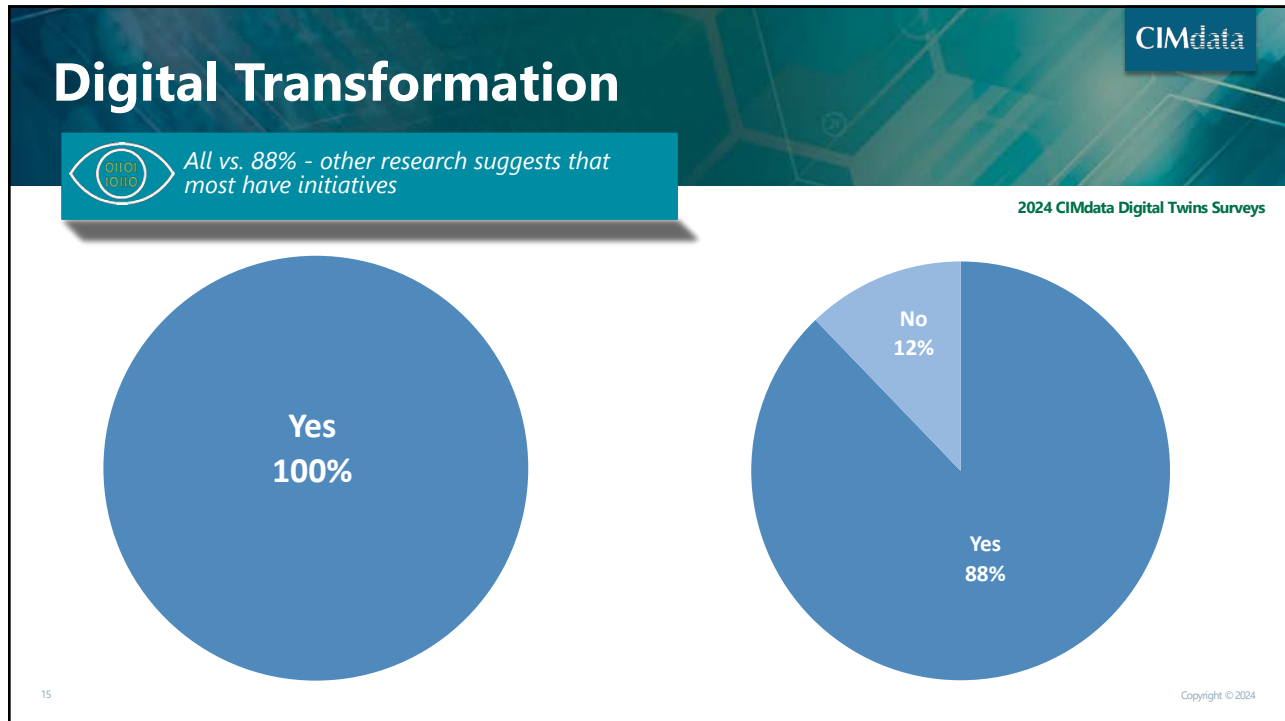
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- Time series of historical operational data
- GIS
- Reduced-order / real-time physics
- Real-time rendering
- Reality capture
- Security incident and event management
- Accounting
- HR
- Supply chain planning
- Production planning
- Financial planning
- Configuration management.
- Identity and access management

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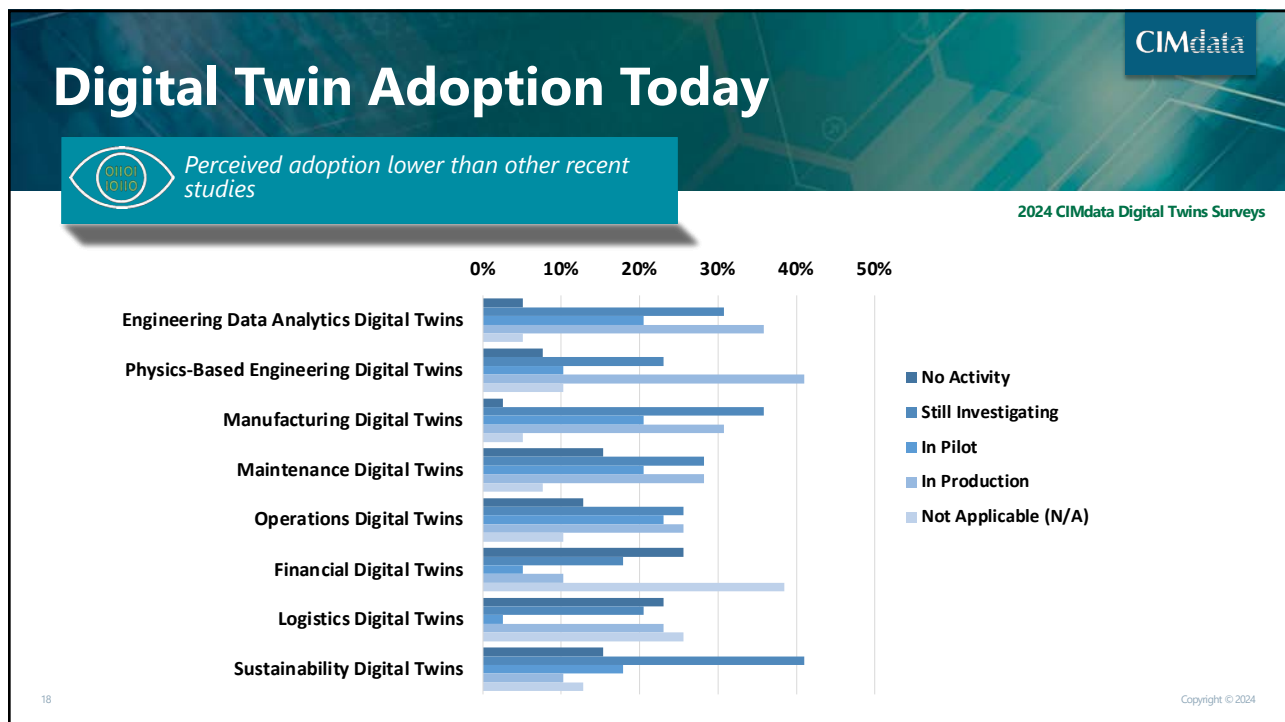
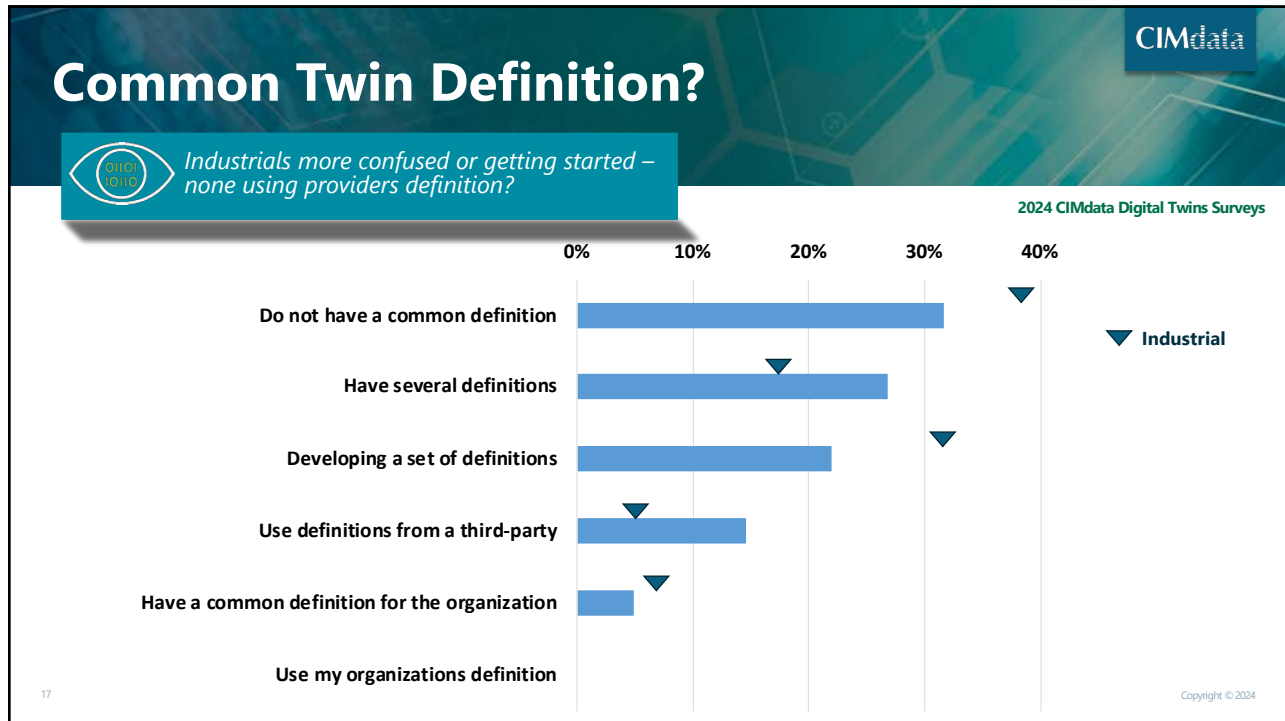
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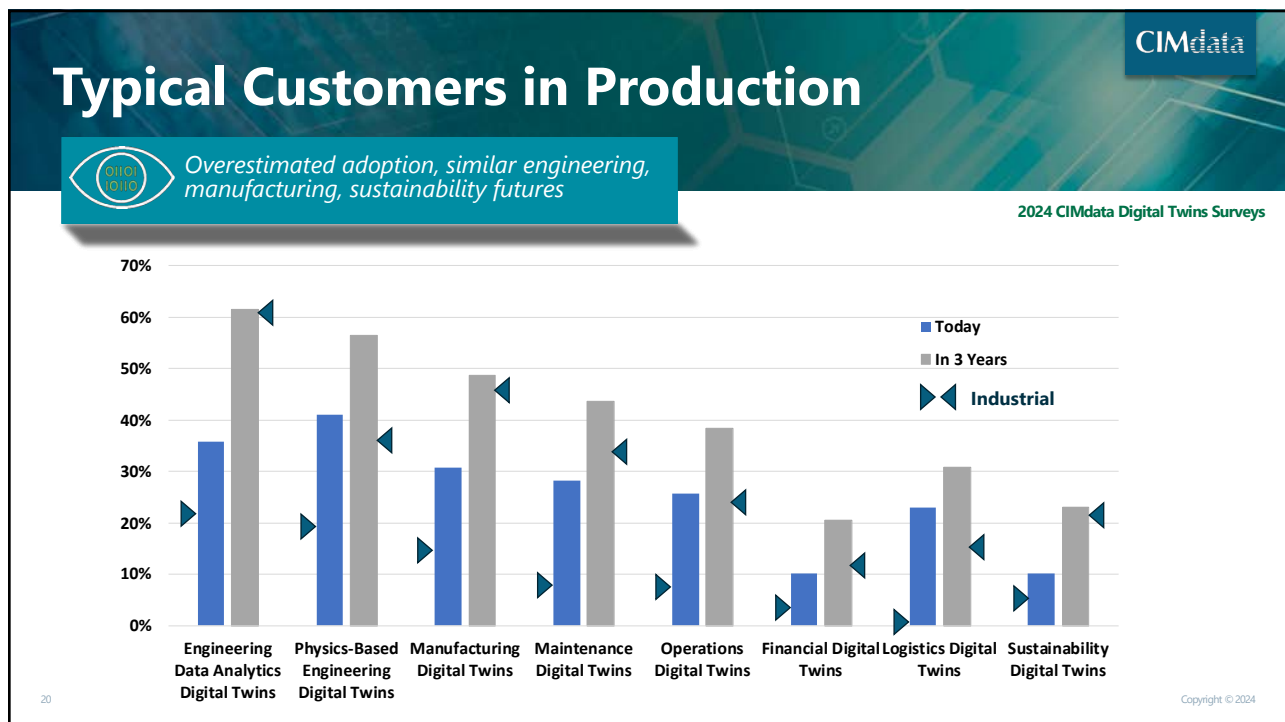
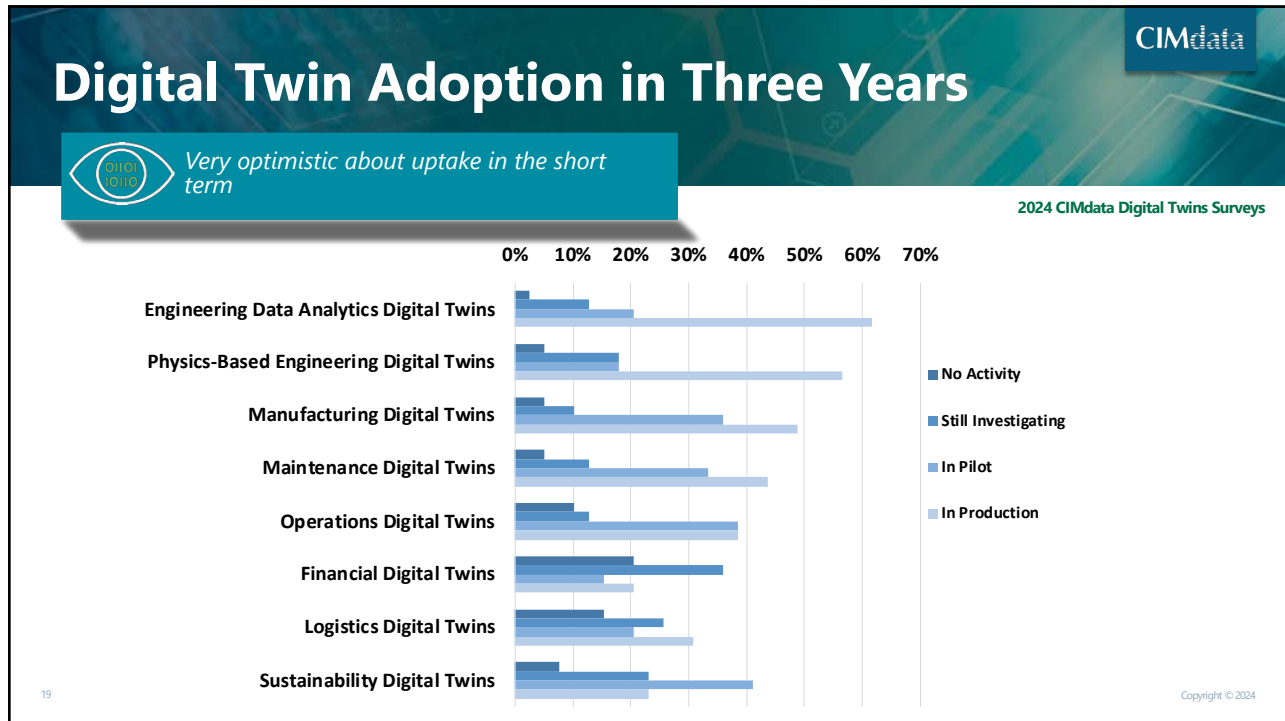
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CIMdata Foresight Poll

 What other types of digital twins not listed in the previous slide are important to your company or your customers? Enter one.

What other types of digital twins not listed in the previous slide are important to your company or your customers? Enter one.

Nobody has responded yet.
Hang tight! Responses are coming in.


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Other Digital Twins?

 Asked "important to your company AND customers" – got sales pitches

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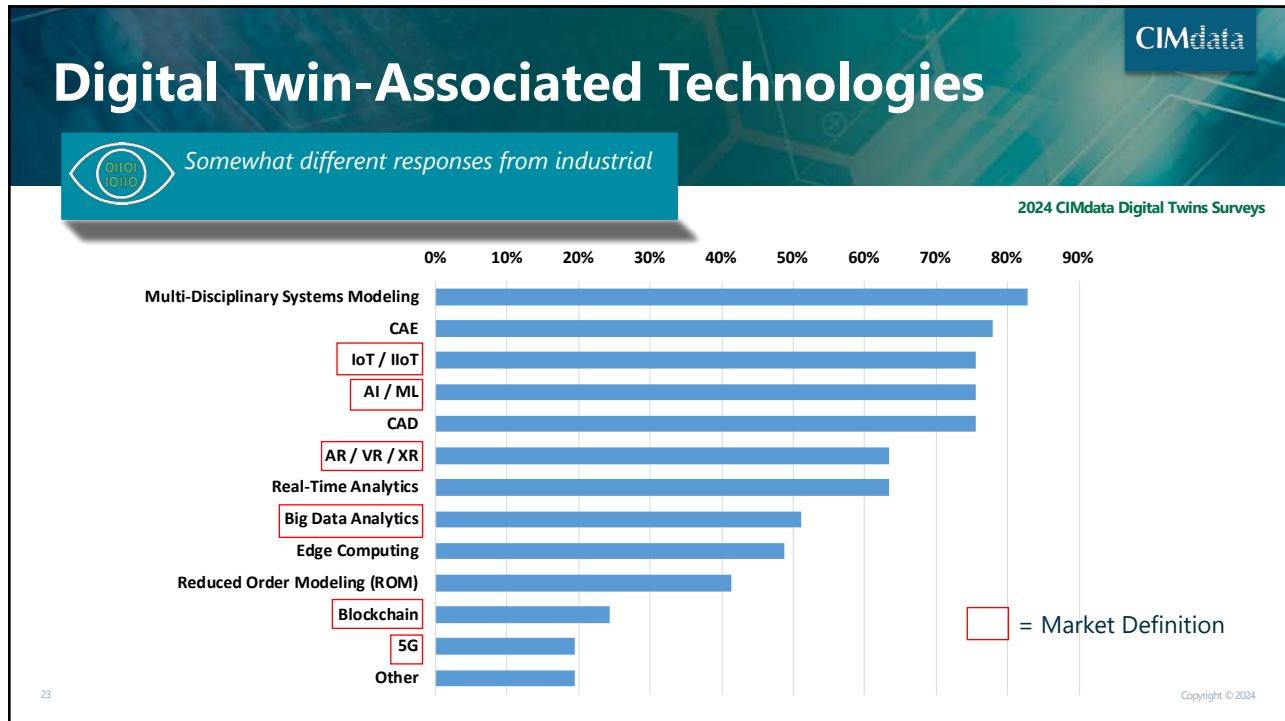
- Virtual twin (a la DS)
- Process digital twins
- Human digital twins
- Consumer sensory profiles
- Marketing & sales digital twins
- Supply chain twin
- Systems twin
- Enterprise architecture
- Supply chain planning
- Product architecture digital twins

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Differing Views on the Same Technologies

Top seven the same, just shifted – overestimated MSBE adoption earlier

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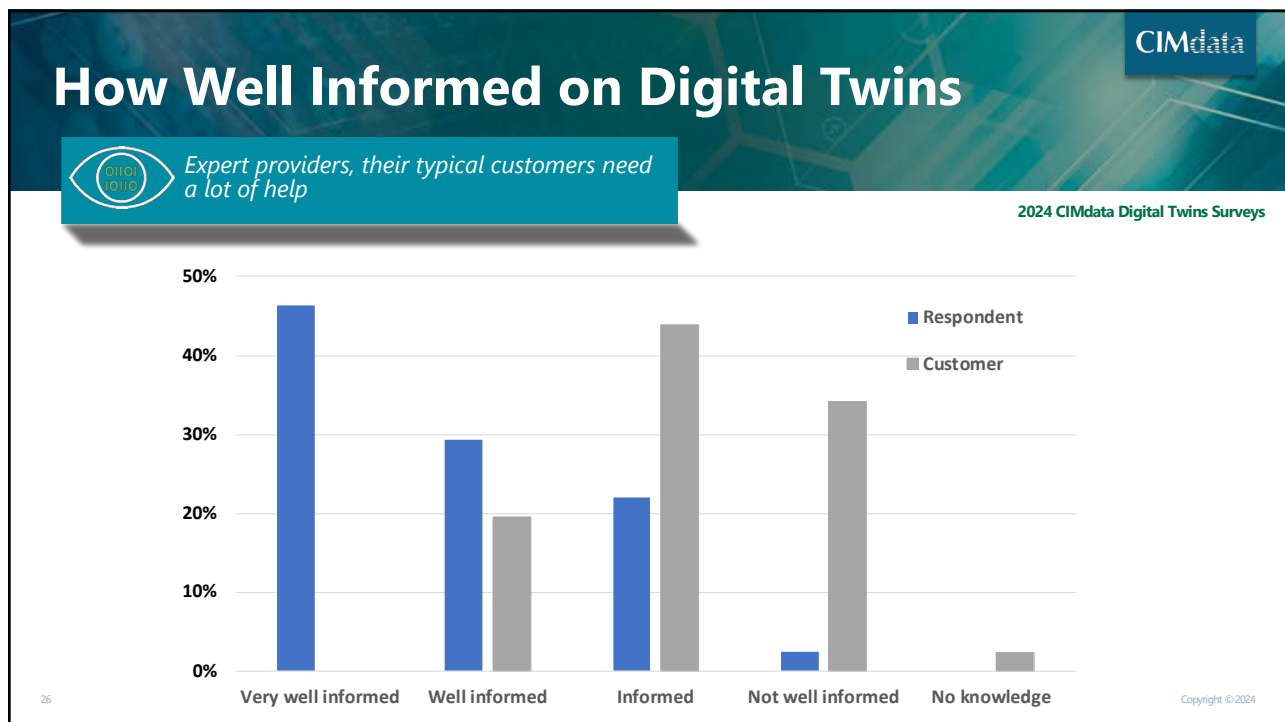
Industrial Response	PLM Economy Response
IoT / IIoT	Multi-Disciplinary Systems Modeling
CAD	CAE
CAE	IoT / IIoT
AR / VR / XR	AI / ML
Multi-Disciplinary Systems Modeling	CAD
AI / ML	AR / VR / XR
Real-Time Analytics	Real-Time Analytics

Legend: **Bold** = included in both responses

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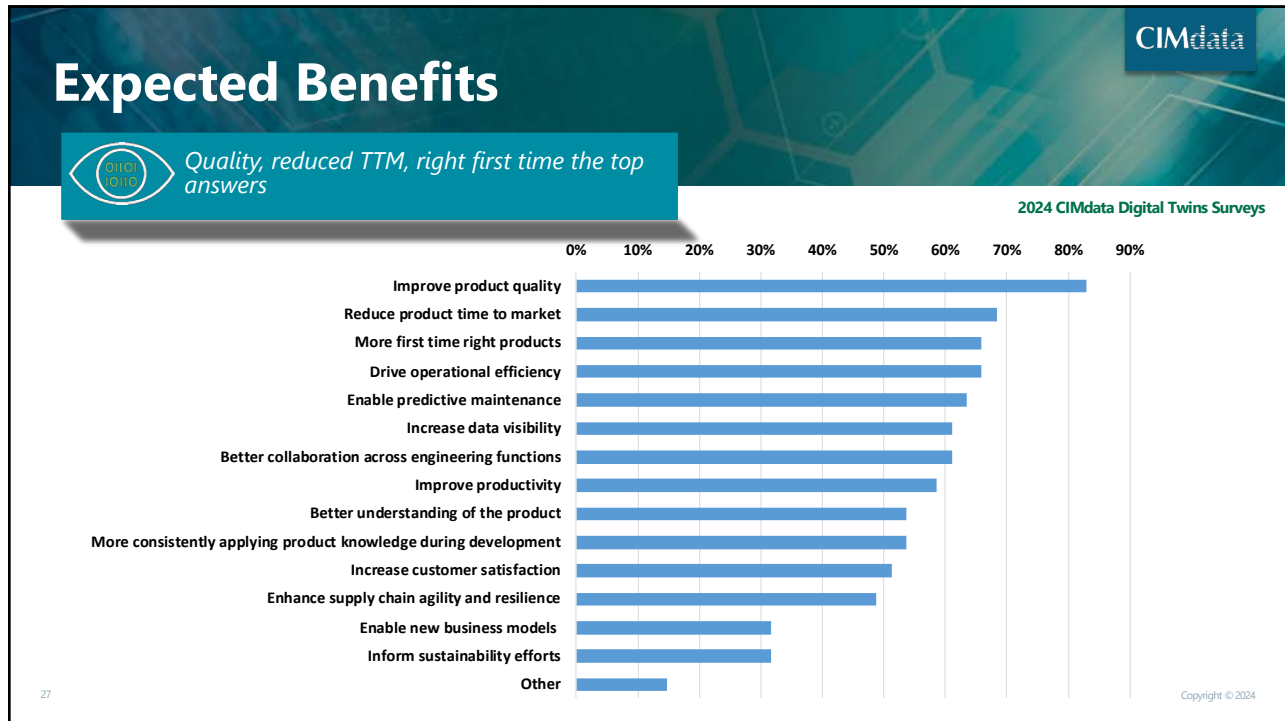
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Differing Views on Benefits
Priorities different in each group

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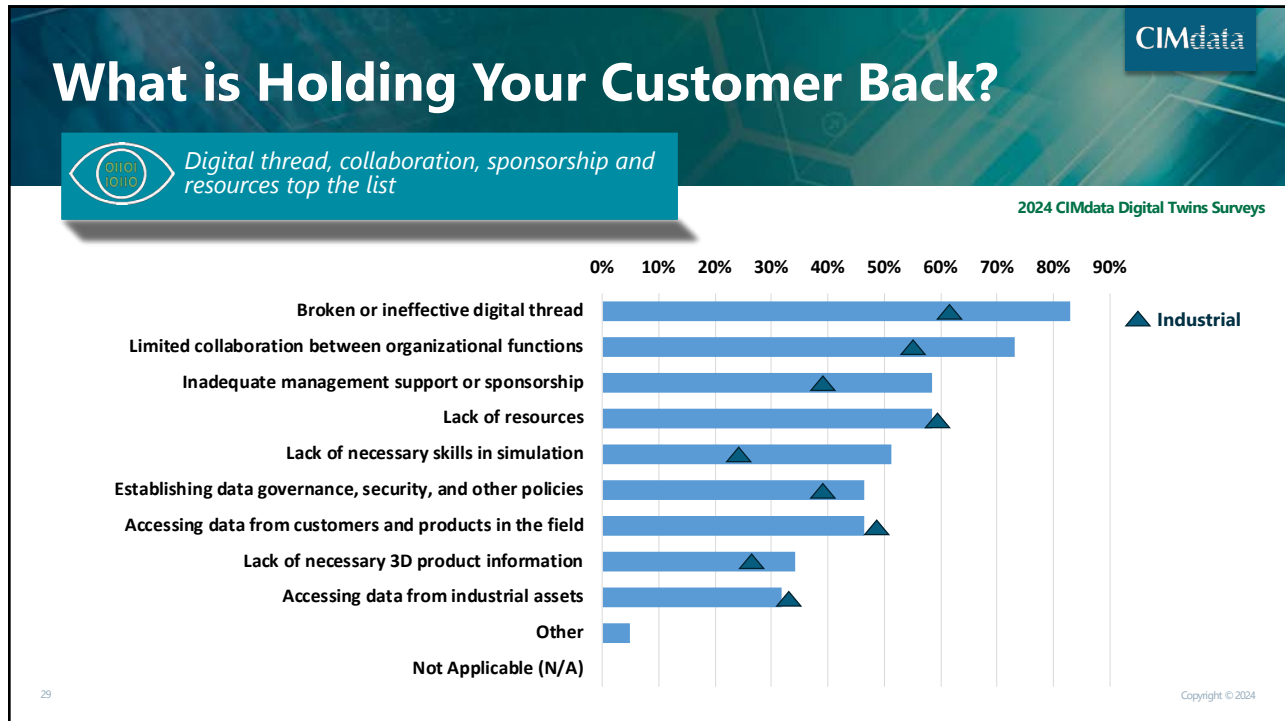
Industrial Response	PLM Economy Response
Better collaboration across engineering functions	Improve product quality
Better understanding of the product	Reduce product time to market
More consistently applying product knowledge during development	More first-time right products
Reduce product time to market	Drive operational efficiency
Improve product quality	Enable predictive maintenance
Increase customer satisfaction	Increase data visibility
Increase data visibility	Better collaboration across engineering functions

Bold = included in both responses

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Similar Views on Constraints

Pretty consistent understanding across the two respondent groups

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Industrial Response	PLM Economy Response
Broken or ineffective digital thread	Broken or ineffective digital thread
Lack of resources	Limited collaboration between organizational functions
Limited collaboration between organizational functions	Inadequate management support or sponsorship
Accessing data from customers and products in the field	Lack of resources
Inadequate management support or sponsorship	Lack of necessary skills in simulation
Establishing data governance, security, and other policies	Establishing data governance, security, and other policies
Accessing data from industrial assets	Accessing data from customers and products in the field

Bold = included in both responses

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What is the Business Opportunity?



*Confirmed a lot of confusion in the market,
need education and support (1 of 2)*

- Both sides agree on the importance of digital twins, have lofty expectations, will need help to get there
- The PLM Economy respondents clearly see lots of digital thread opportunity, well beyond industrial responses; broken or ineffective thread a major inhibitor
- Getting better agreement on benefits could result in quality, TTM efforts at customers
- A lot of confusion and inconsistent level of knowledge in both groups

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What is the Business Opportunity?



*Confirmed a lot of confusion in the market,
need education and support (2 of 2)*

- No consistent definition of digital twins
- Knowledge level of managers vs. practitioners (users)
- Knowledge level of the PLM Economy vs. their customers
- Not a big surprise given the different positioning and messaging across the industry
- CIMdata is already working on several fronts to address these issues
 - Let's talk about how we can help

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Concluding Remarks



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Questions & Answers



What's on your mind?



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