

Digital Twins: The Industrial Perspective

24 Market & Industry Forum—11 April 2024

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

11 April 2024—Frankfurt, GERMANY

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Key Takeaways



Digital Twins: The Industrial Perspective

- Industrial research into digital twin adoption highlights lack of common understanding, focuses on some of the wrong things
- Most respondents plan a robust digital thread to support their digital twin efforts
- Current implementations focus on engineering and physics, but more to come across the lifecycle
- Company position mimics the bell curve, but respondents more knowledgeable than their managers
- Strong benefits expected but many hurdles still remain

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Initiated CIMdata Research

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Built on previous research and knowledge of the PLM Economy offerings



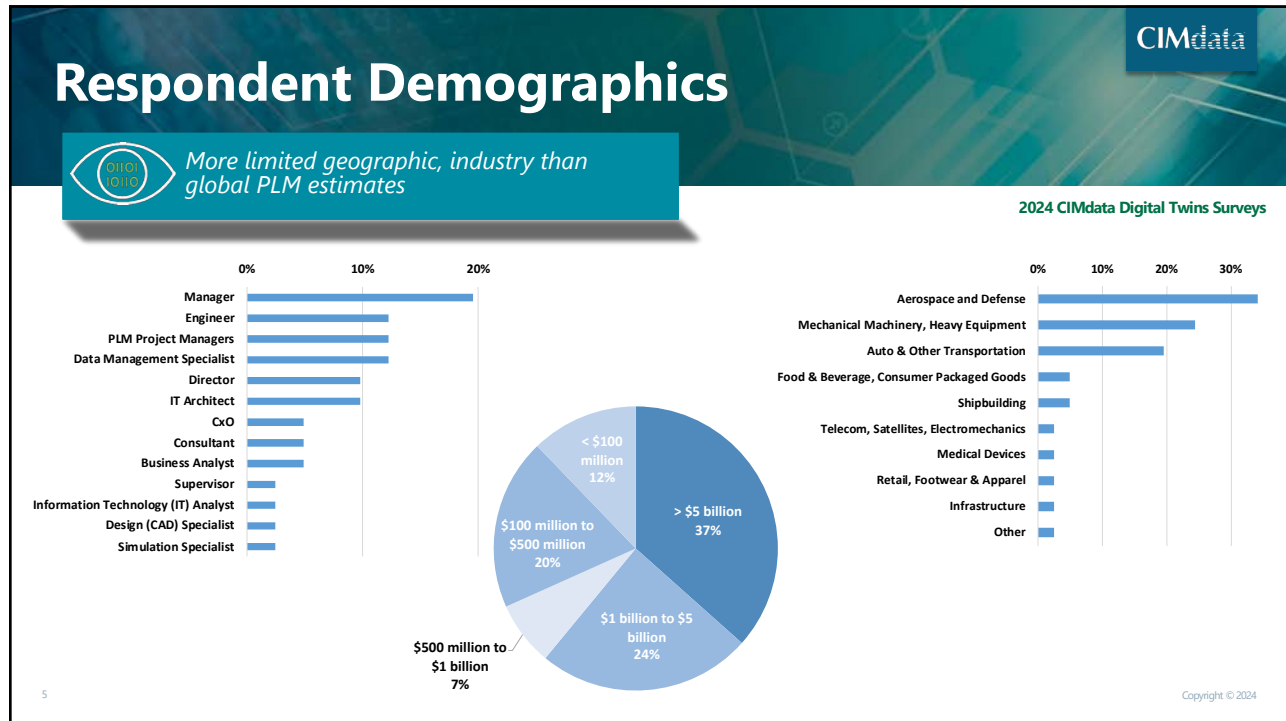
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- CIMdata opened two surveys on digital twins
- One for **industrial respondents**
 - The ideal respondent is knowledgeable about digital transformation, digital thread, and digital twin activities
- One for **software and service providers** enabling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

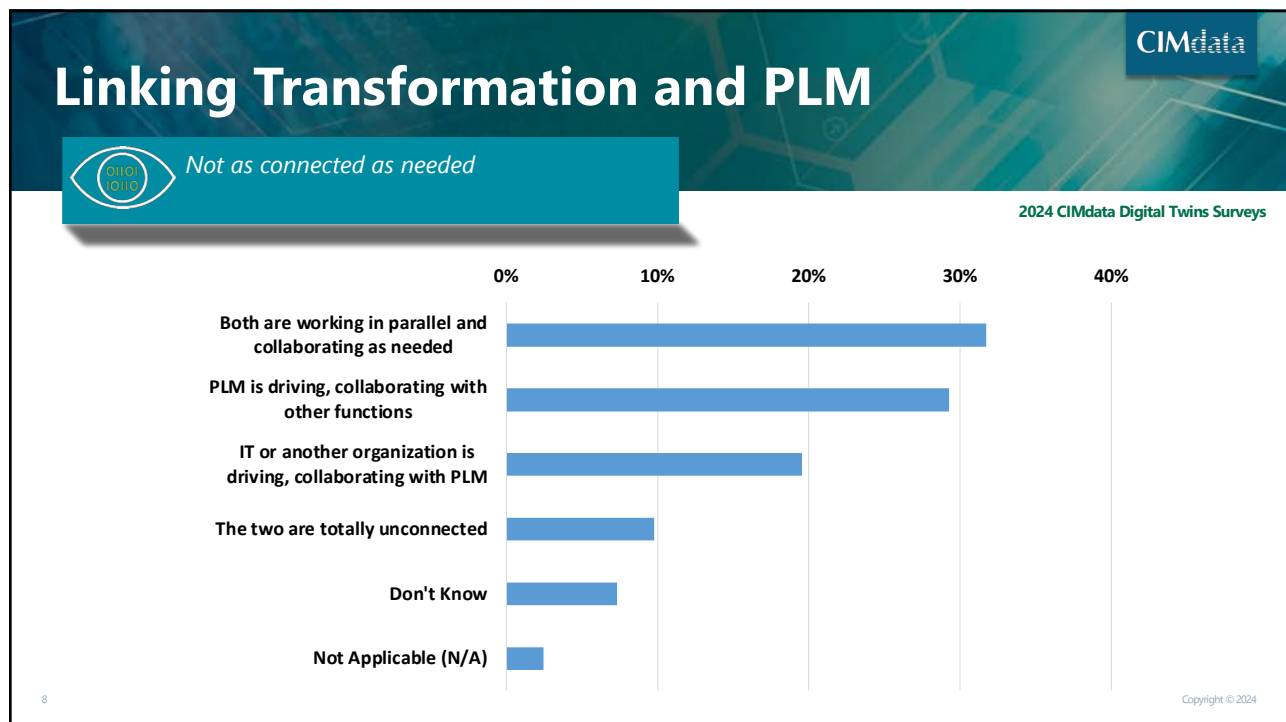
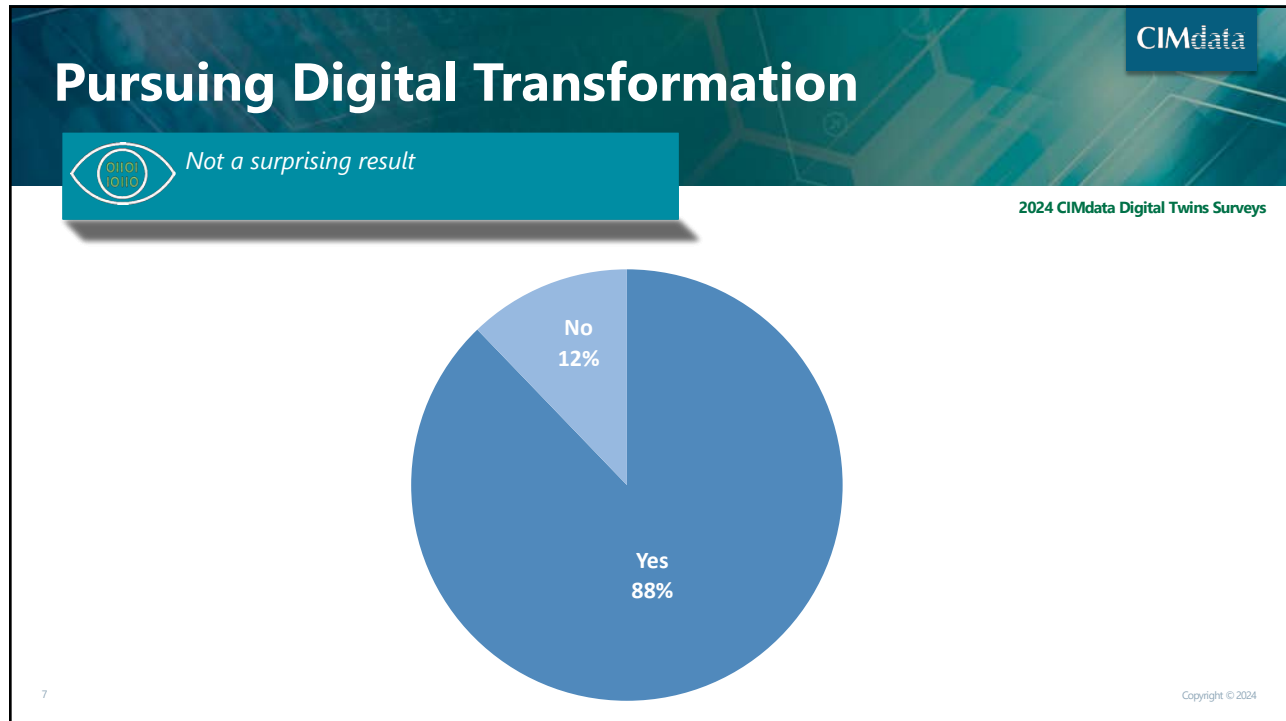
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Model-Based Approaches



Related to and key enablers of digital twin and digital thread

- **Model-Based Definition** (MBD) – The practice of using 3D models (i.e., solid models, 3D PMI and associated metadata) within 3D CAD software to define (provide specifications for) individual components and product assemblies.
- **Model-Based Enterprise** (MBE) – “a vision to transform an enterprise’s engineering, manufacturing, and aftermarket services through product data reuse and derived context, rather than interpreting inputs and recreating the models and drawings.” Leverages Model-Based Definition (MBD).
- **Model-Based Systems Engineering** (MBSE) – “the formalized application of modeling to support system requirements, design, analysis, verification and validation activities beginning in the conceptual design phase and continuing throughout development and later life cycle phases.”

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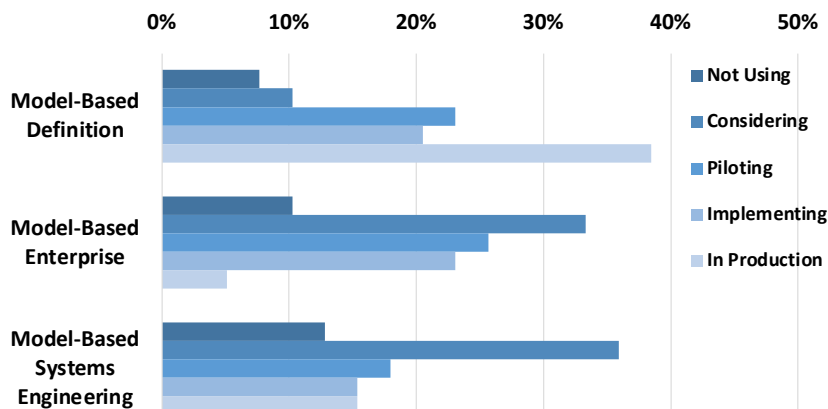
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Model-Based Process Interest & Adoption



Solid for MBD, less so for MBE and MBSE

2024 CIMdata Digital Twins Surveys



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What Belongs on the Digital Thread?



Many possible, some core to defining, building, supporting smart connected products

- Many applications and data sources can be included in industrial digital threads
- Are some applications more important than others?
- Our focus revolved around our PLM definition, which spans from “idea through life”
 - Requirements – MBSE – MCAD – Software – EDA – PDM – ERP – MES – Maintenance
- Asked respondents what is on their digital thread today and will be in 3 years...

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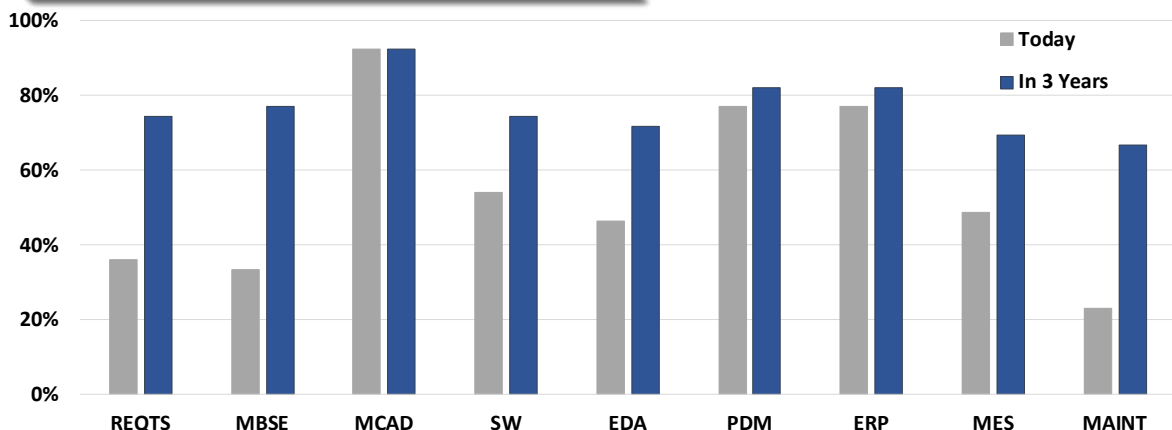
Core Digital Thread Contributors



Focus on idea through life – 2024 results very similar to 2021 survey

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Other Digital Thread Contributors

 A range of applications and data sources


2024 CIMdata Digital Twins Surveys

- CRM (5)
- SCM
- Chemical / material regulation management
- Sustainability management
- DYNAMICS AX/365
- Reporting / analytics / AI/ML
- Service BOM
- Project management
- Semantic integration layer based on Graph database (2)
- PPM, formulation and device integration
- Internal data lake, field service and other issue/quality applications

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CIMdata Foresight Poll

 What other data sources are important to include in digital thread? Please enter one.

What other data sources are important to include in digital thread? Please enter one.

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

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Altair Digital Twin Global Survey



Statistically significant results from global study, well-defined sampling frames



- 69% currently leveraging digital twin technology, 23% not
- 50% claimed “highly knowledgeable” but 22% said digital twin “confusing”
- Upper-level employees and user-level employees understood, viewed, and used digital twin technology differently

15 https://altair.com/docs/default-source/pdfs/altair_dt-global-survey-report_web.pdf?sfvrsn=b5acea9_28

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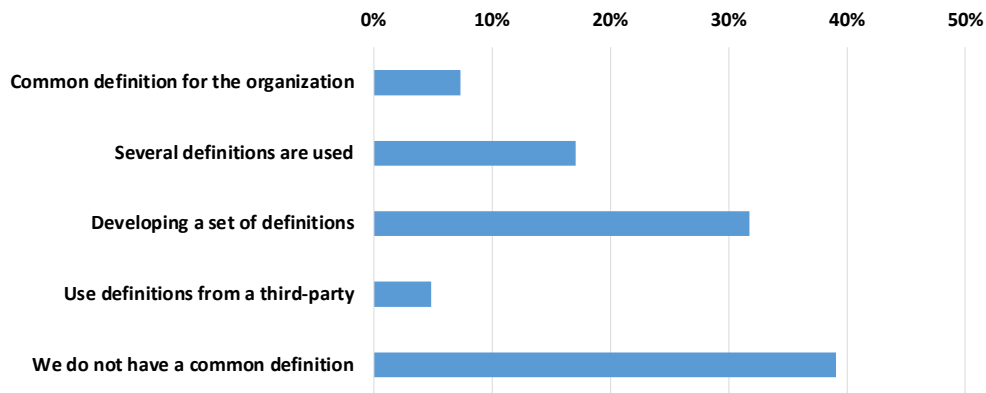
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Common Digital Twin Definitions



A bit problem also shown in other industrial research

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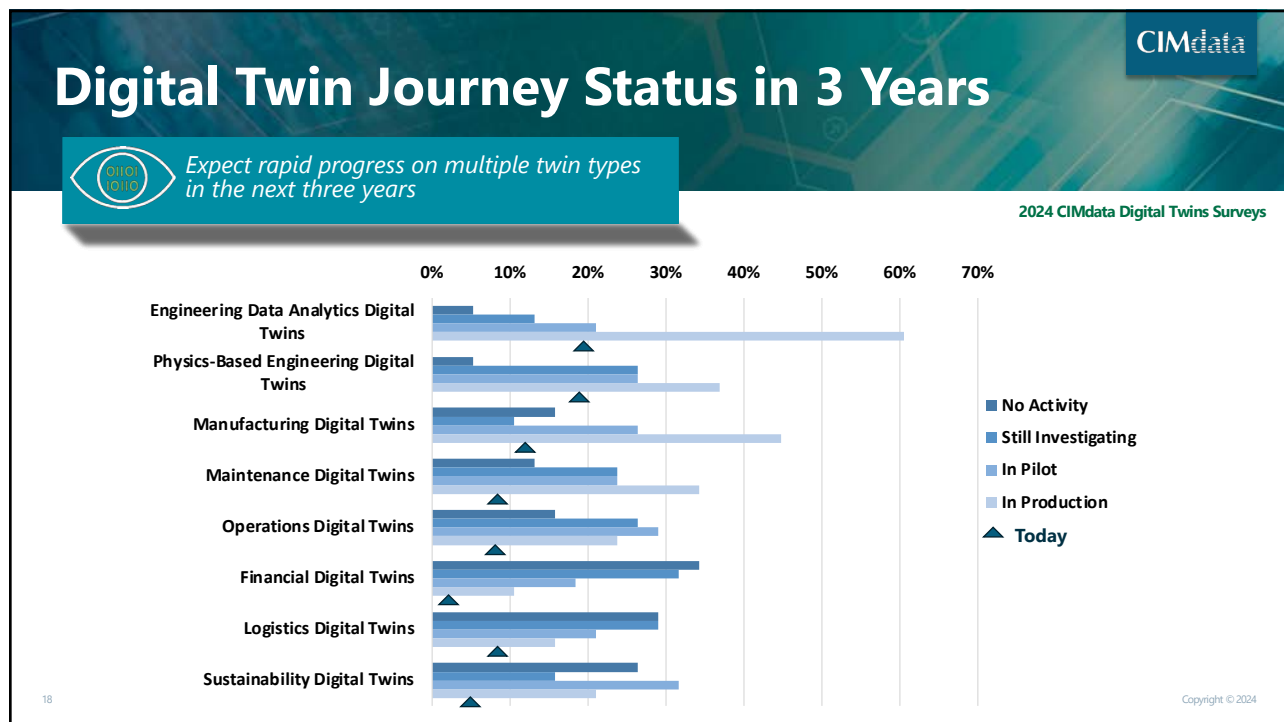
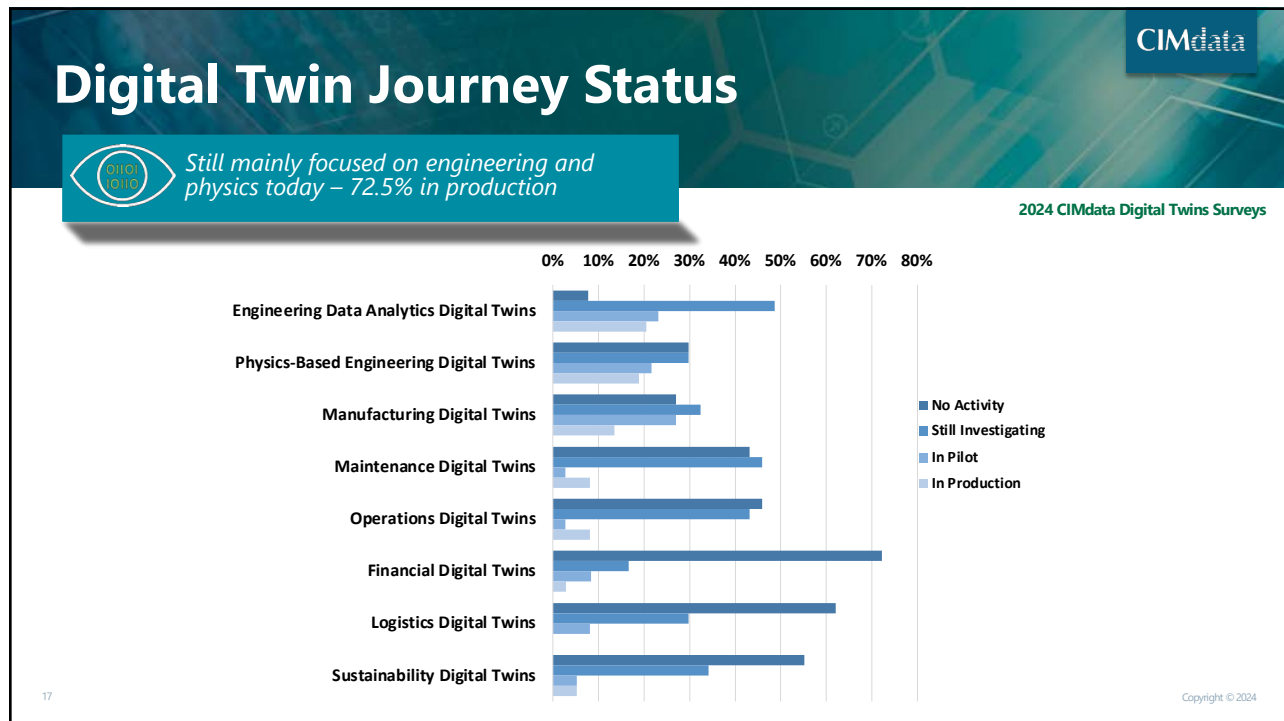


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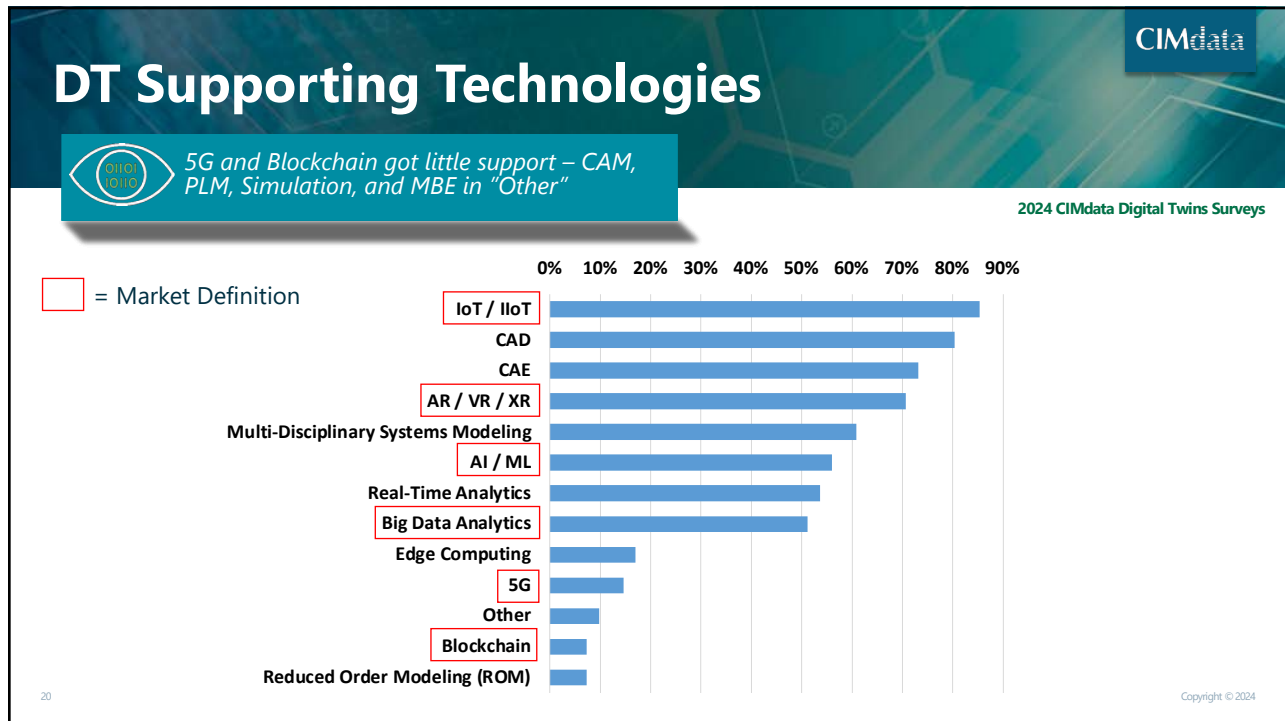
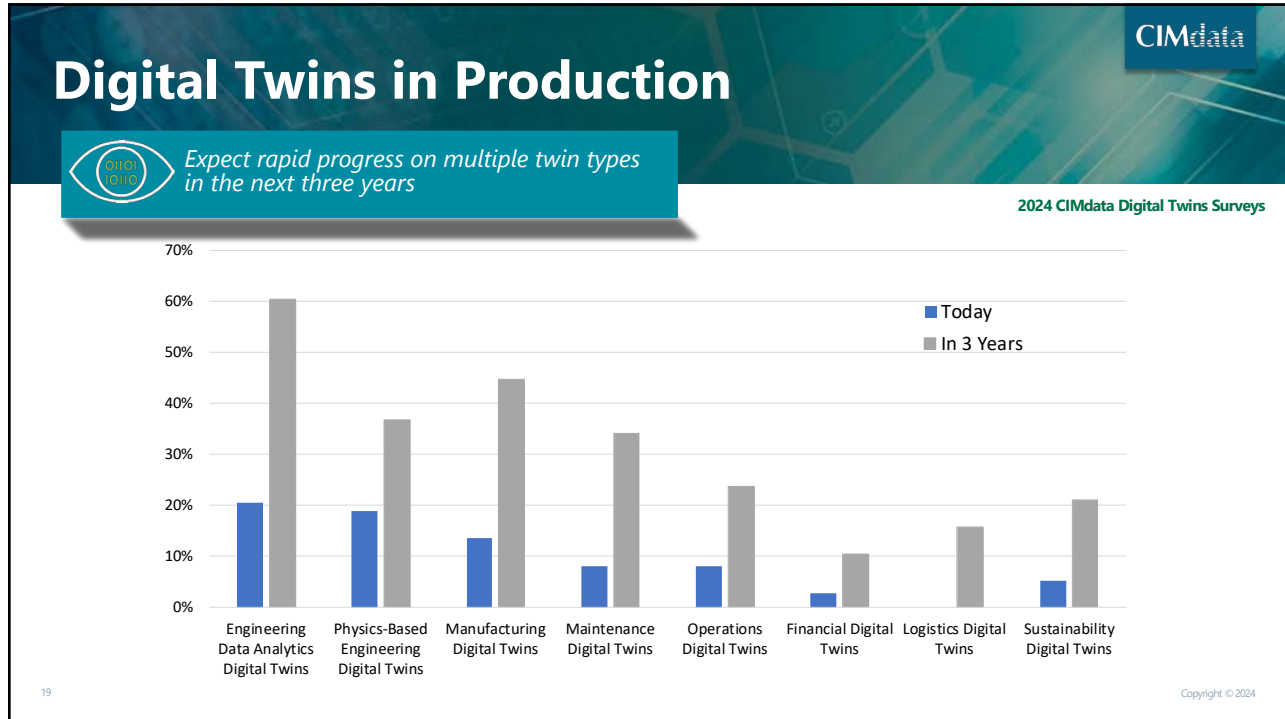
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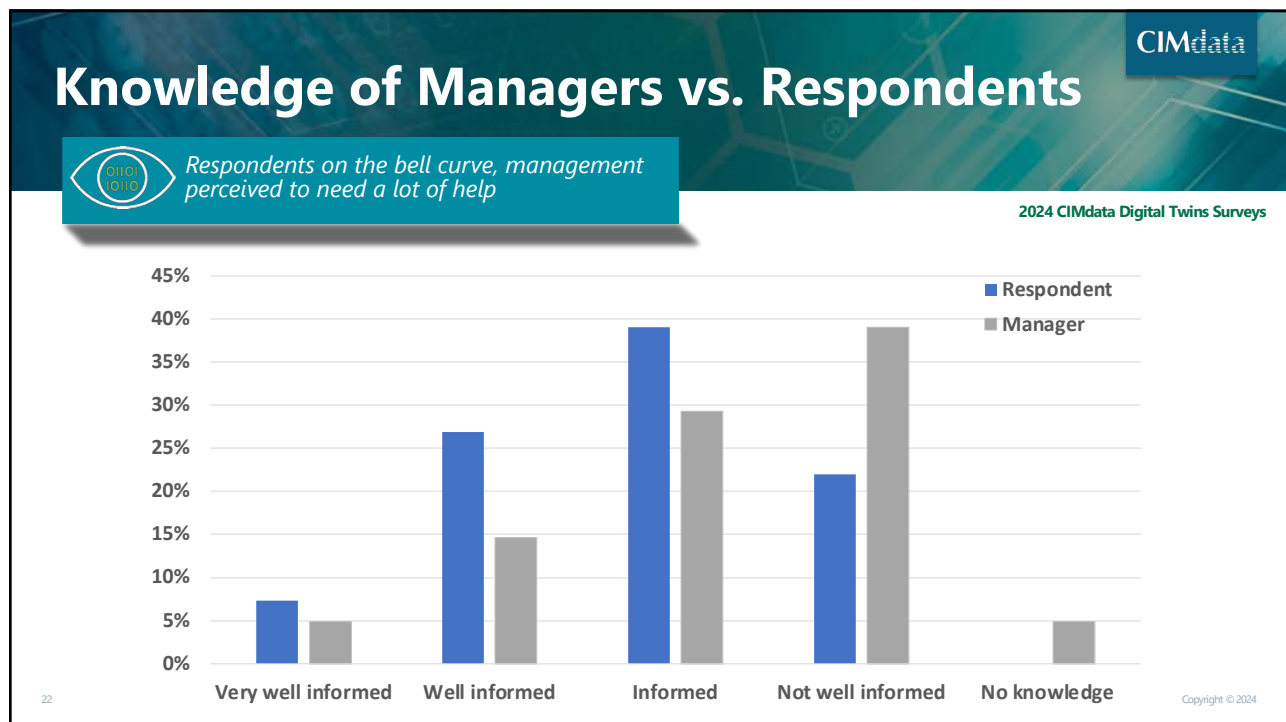
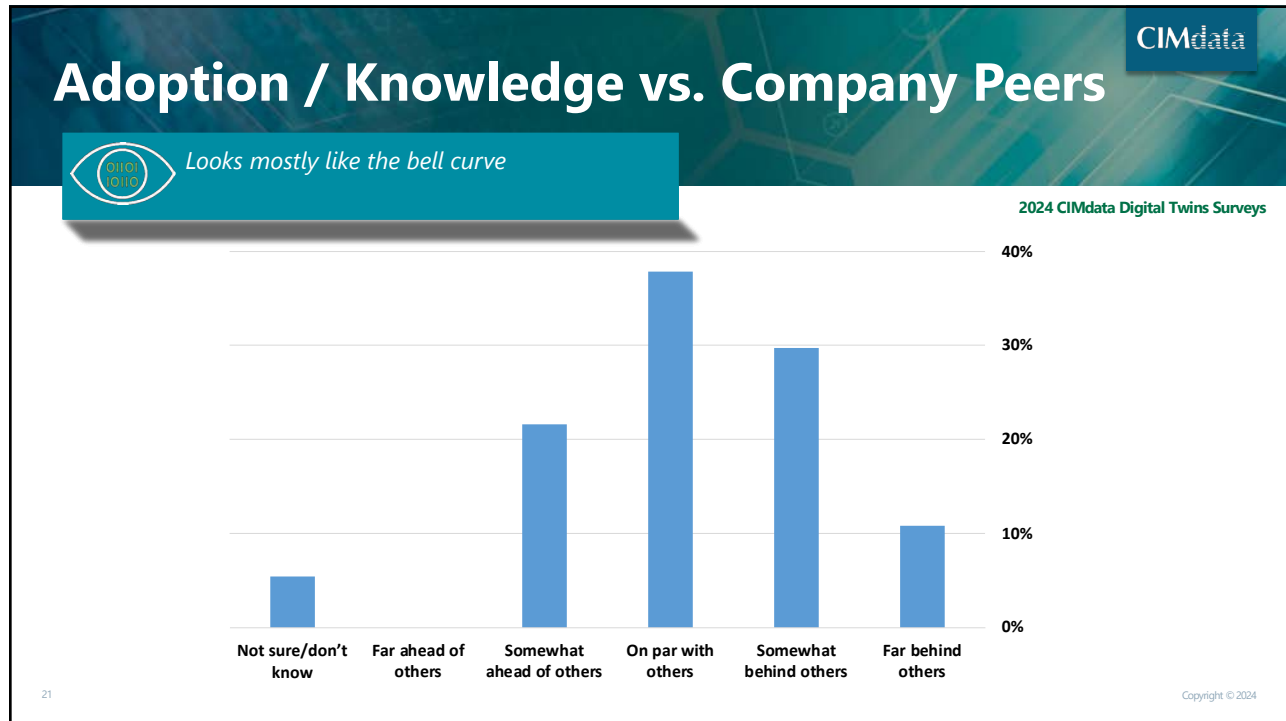
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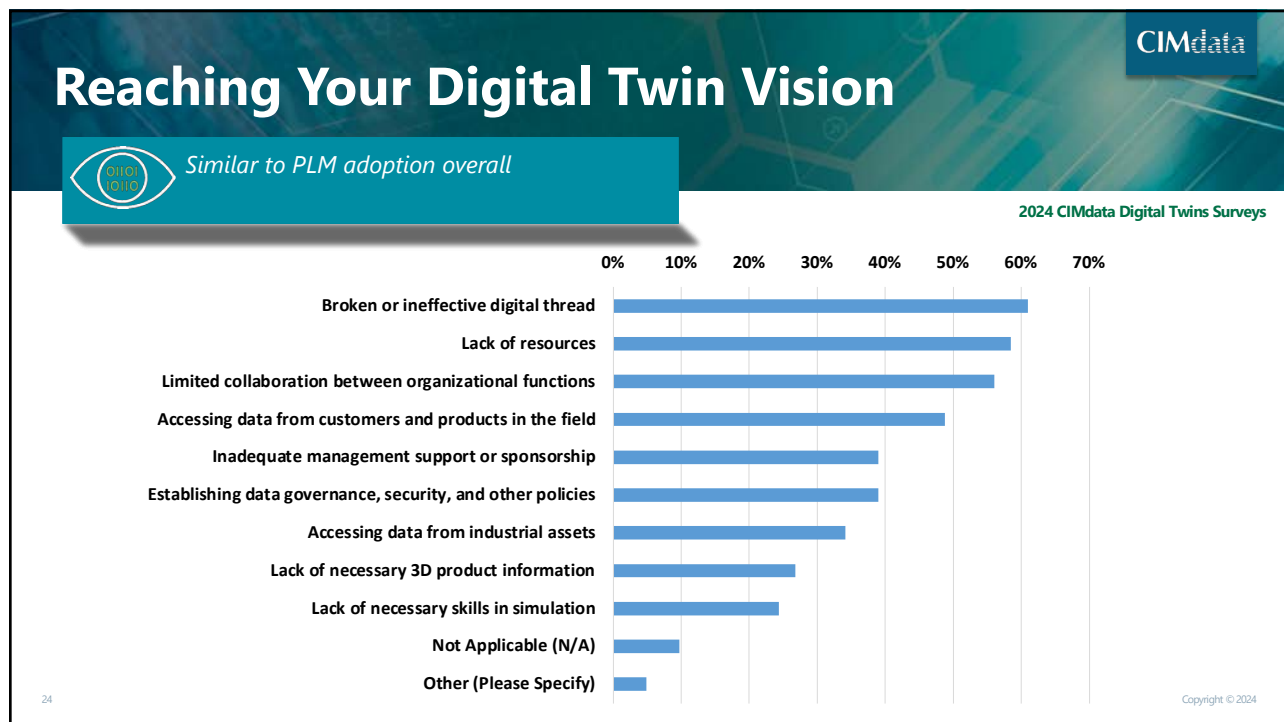
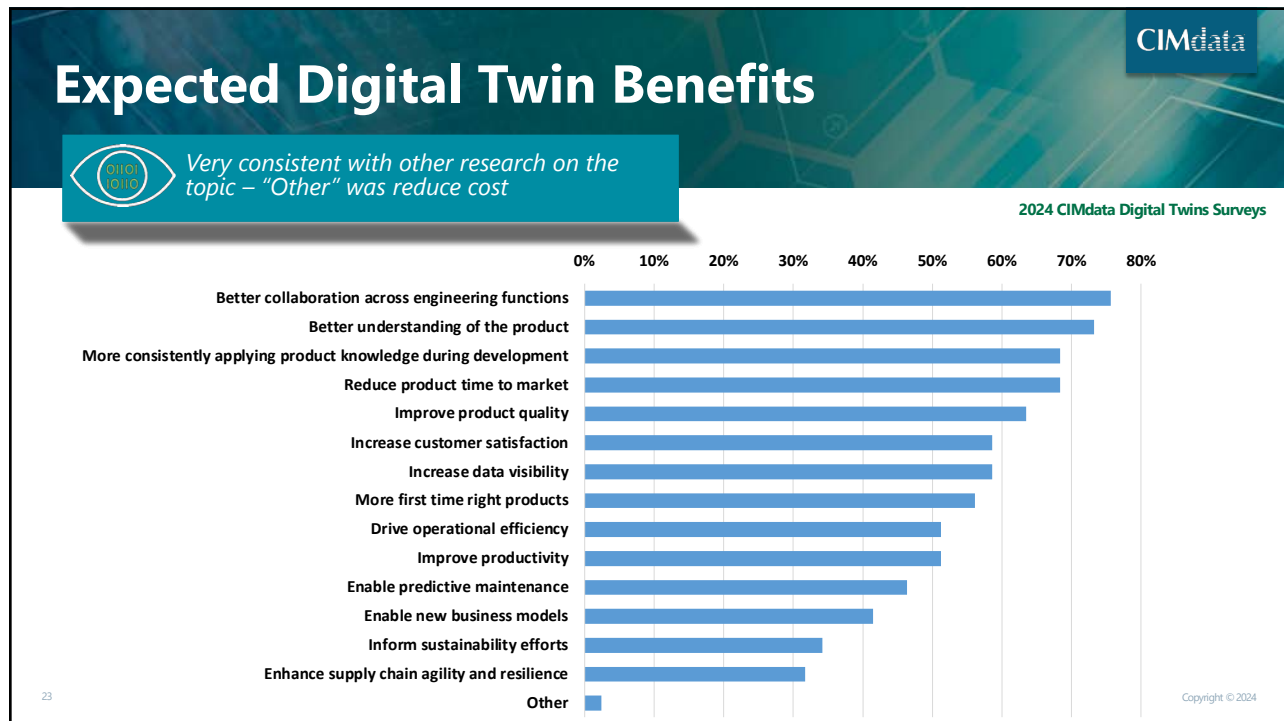
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Concluding Remarks



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Questions & Answers



What's on your mind?



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