

Digital Twins: The Industrial Perspective

24 Market & Industry Forum—27 March 2024

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

27 March 2024—Ann Arbor, MI USA

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

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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

3

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Initiated CIMdata Research



Built on previous research and knowledge of the PLM Economy offerings



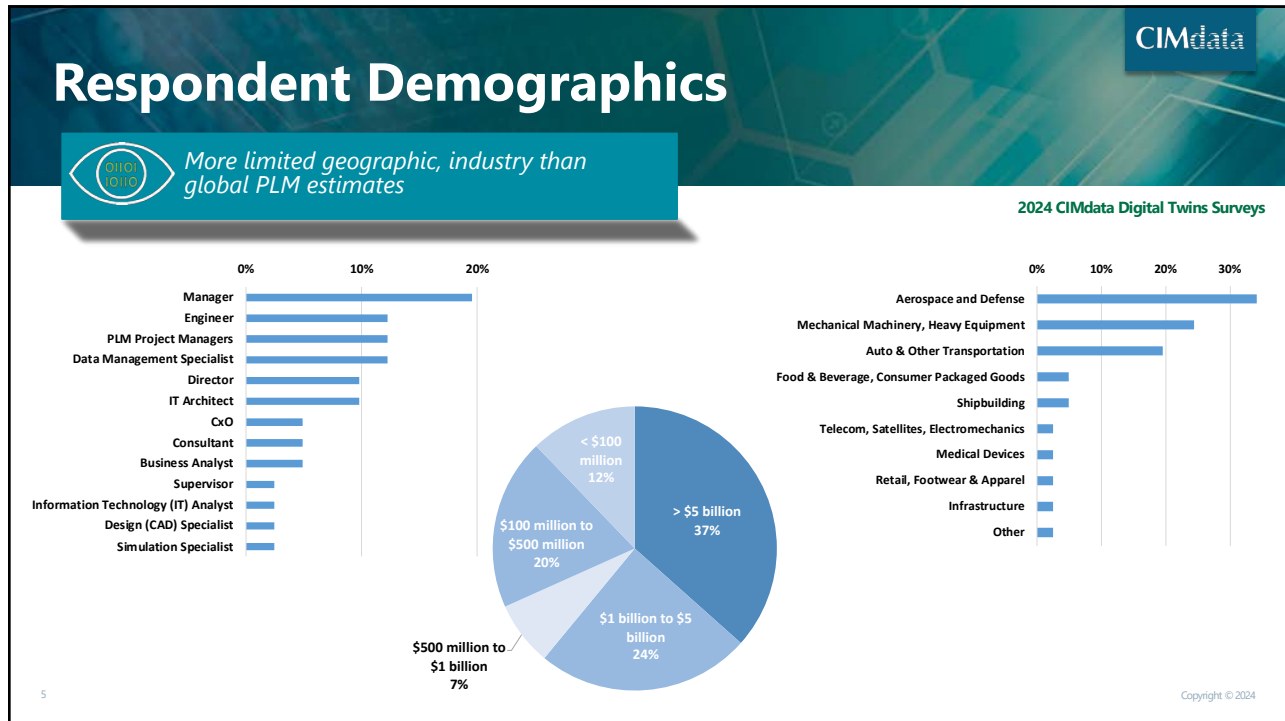
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- CIMdata opened two surveys on digital twins
- One for **industrial respondents**
 - The ideal respondent is knowledgeable about digital transformation, digital thread, and digital twin activities
- One for **software and service providers** enabling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

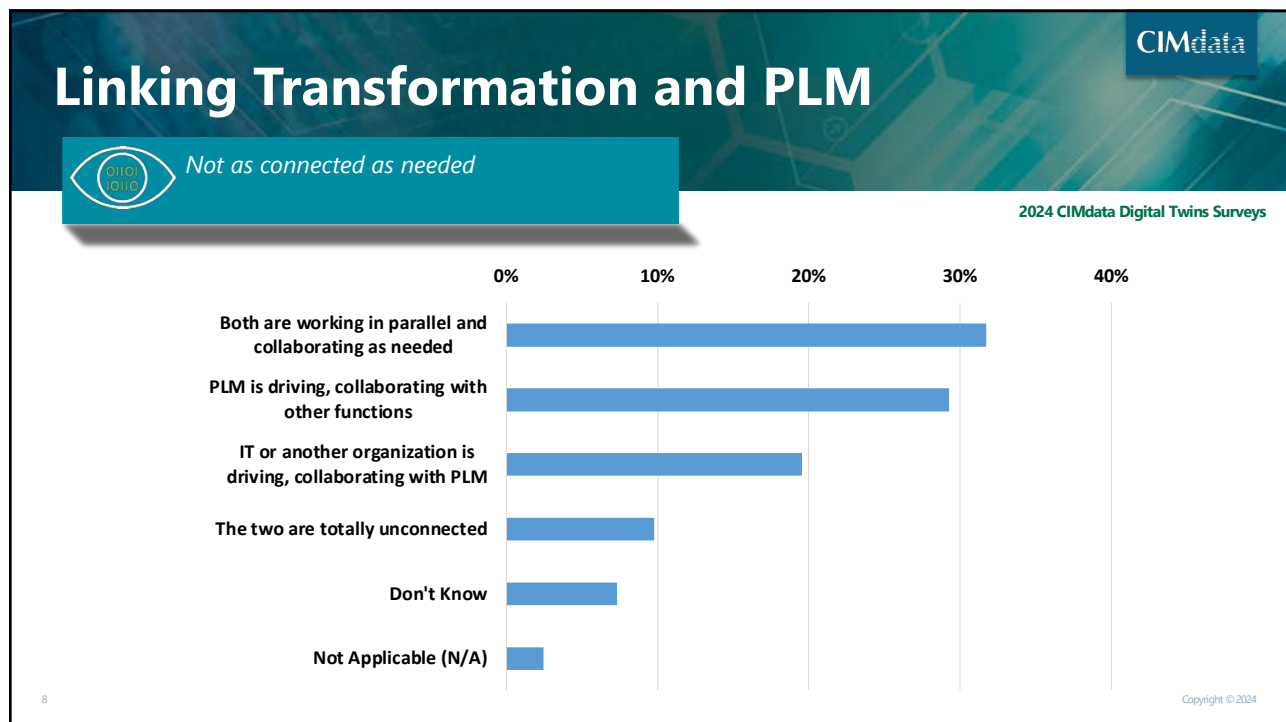
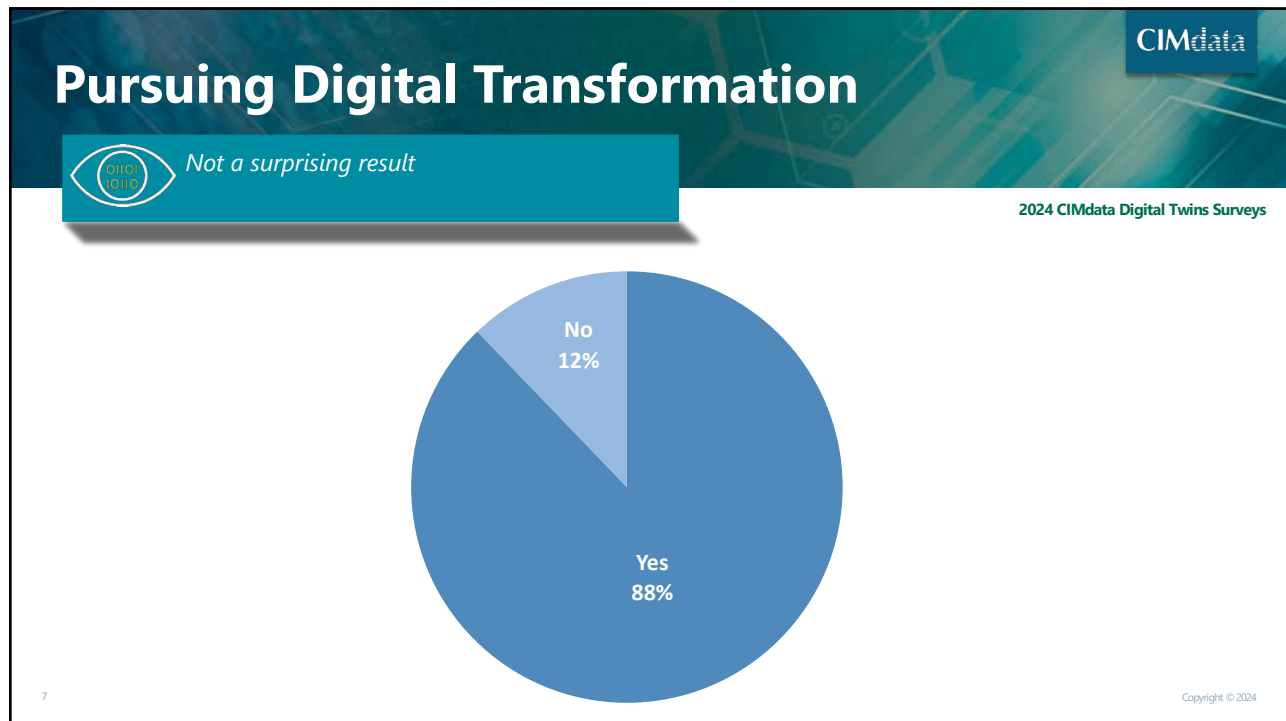
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Model-Based Approaches



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.”

9

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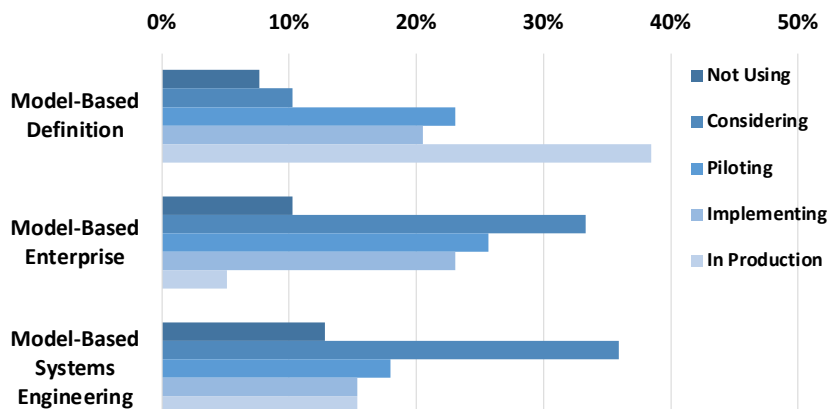
Model-Based Process Interest & Adoption

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Solid for MBD, less so for MBE and MBSE

2024 CIMdata Digital Twins Surveys



10

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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...

11

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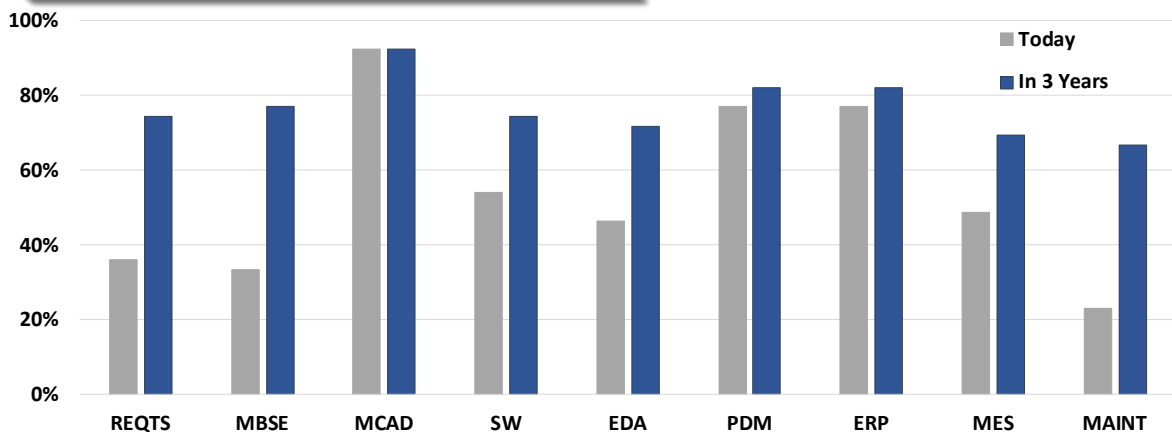
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Core Digital Thread Contributors



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

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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

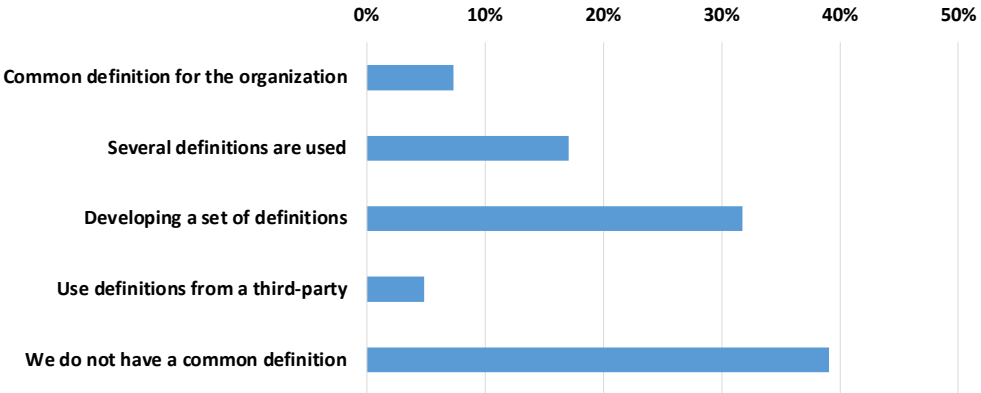
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Common Digital Twin Definitions

 A bit problem also shown in other industrial research

2024 CIMdata Digital Twins Surveys

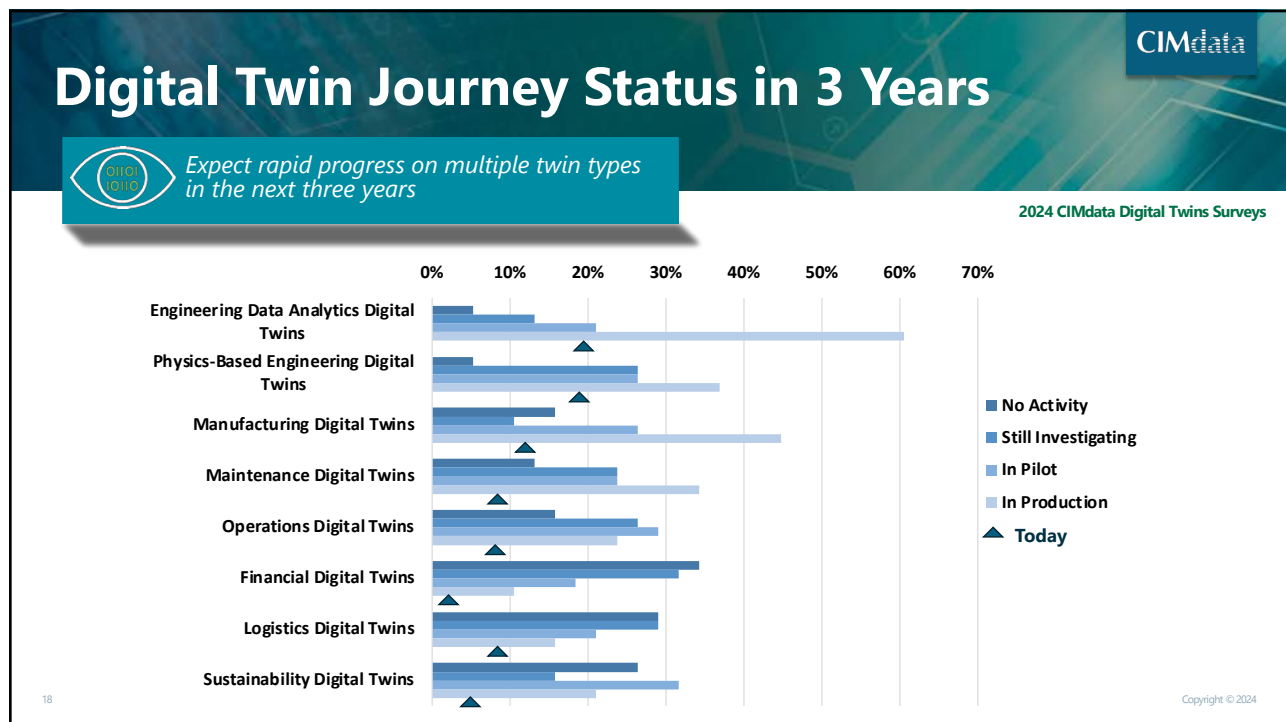
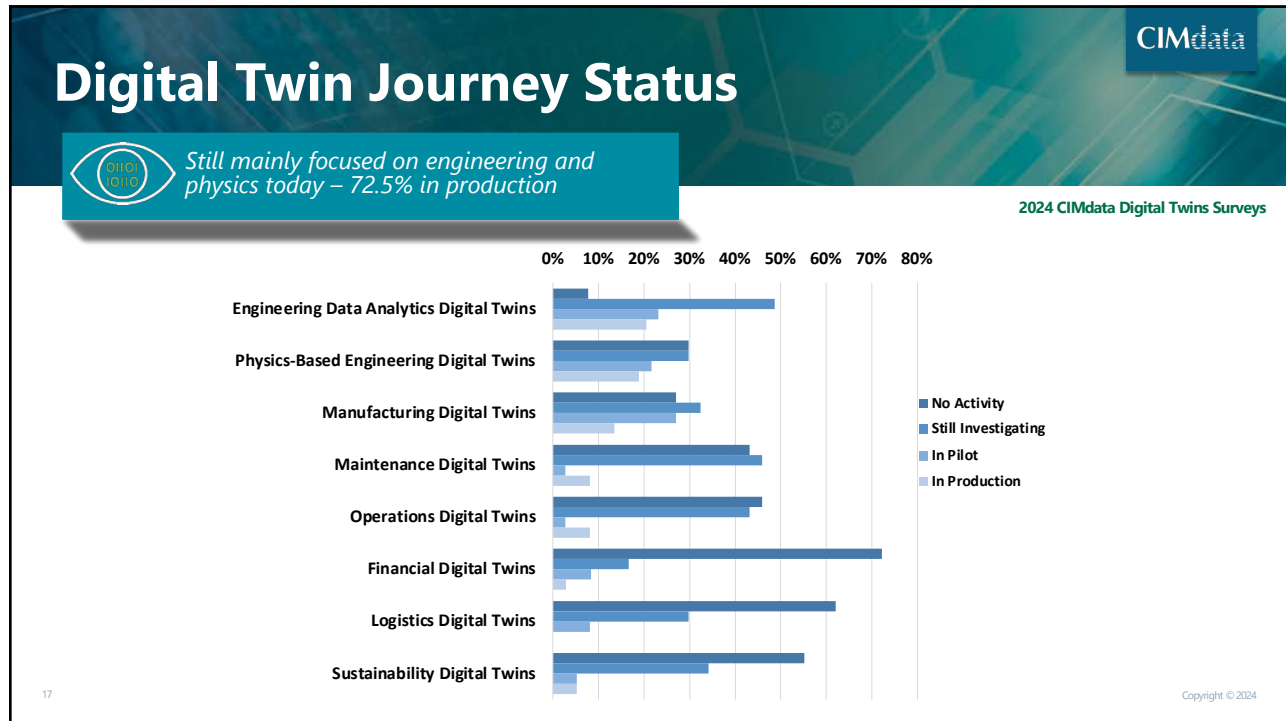


Definition Approach	Percentage
Common definition for the organization	~8%
Several definitions are used	~18%
Developing a set of definitions	~32%
Use definitions from a third-party	~5%
We do not have a common definition	~42%

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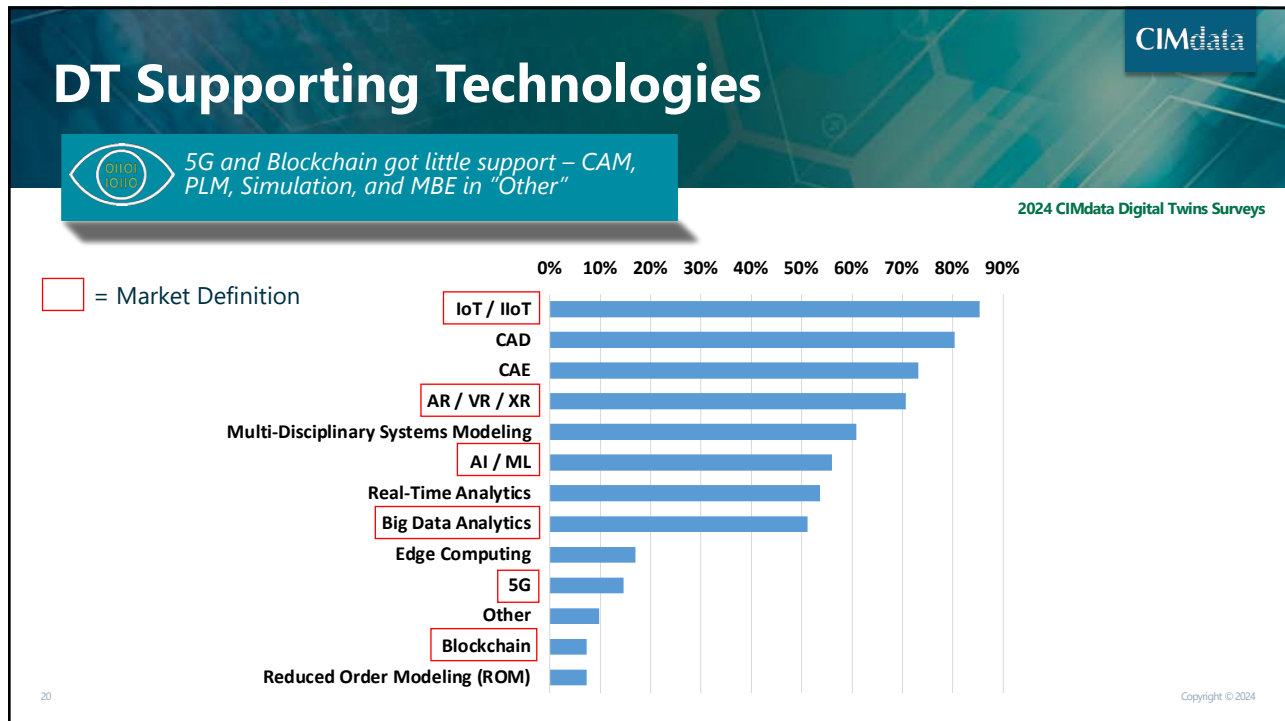
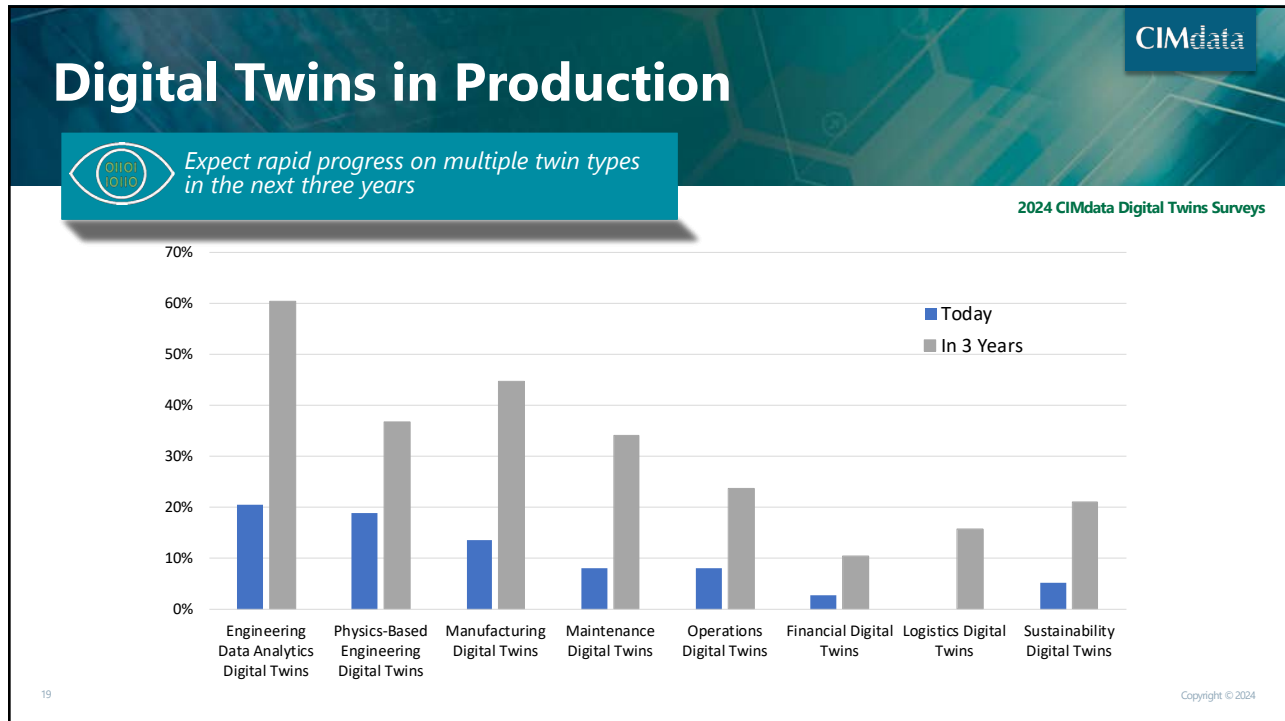
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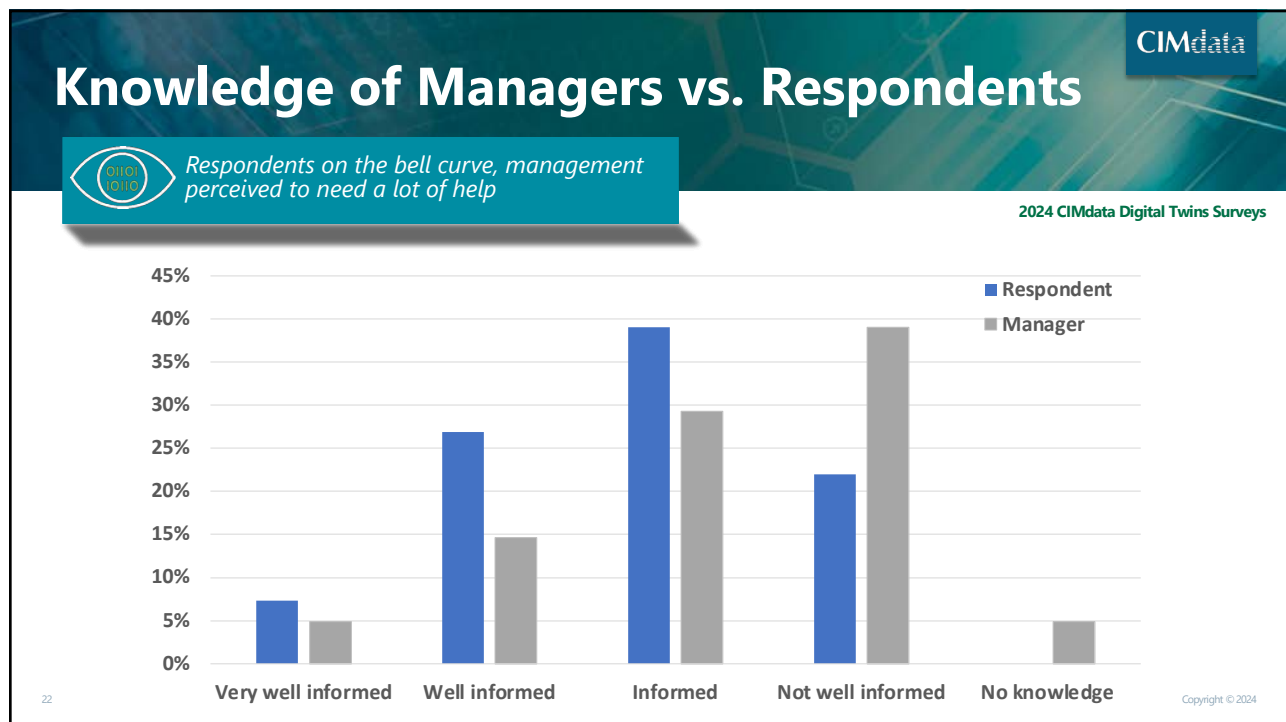
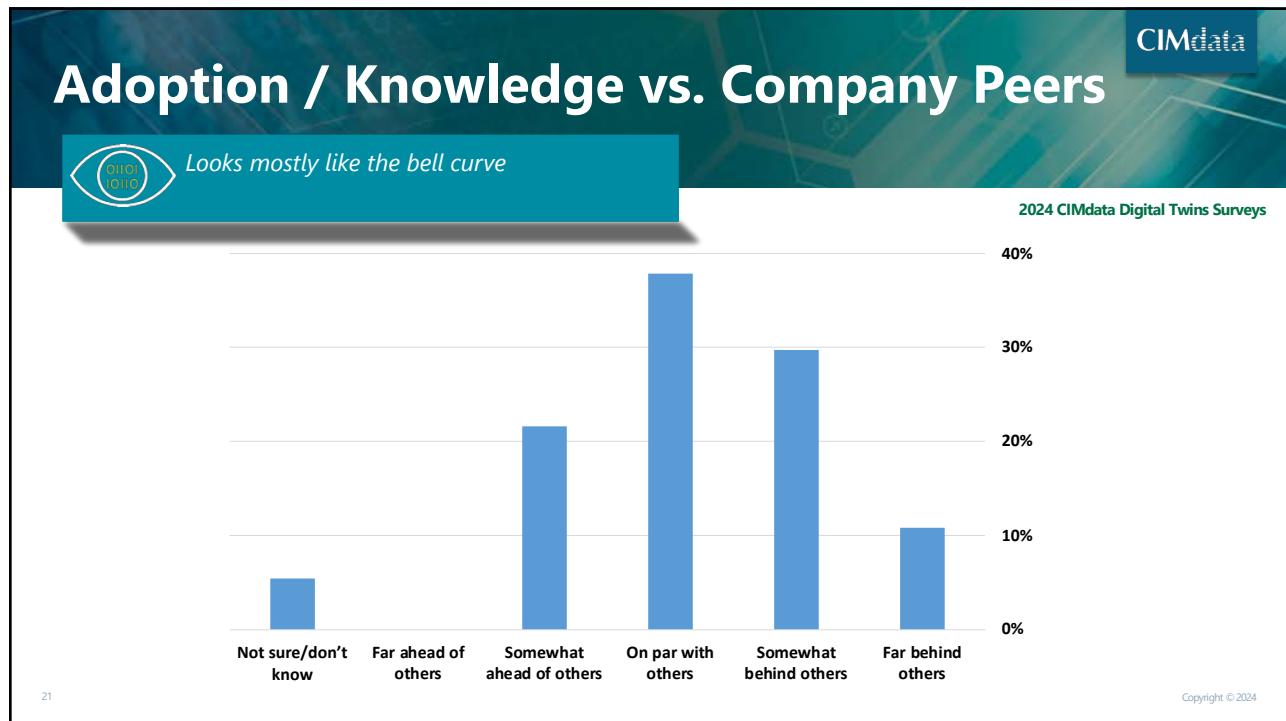
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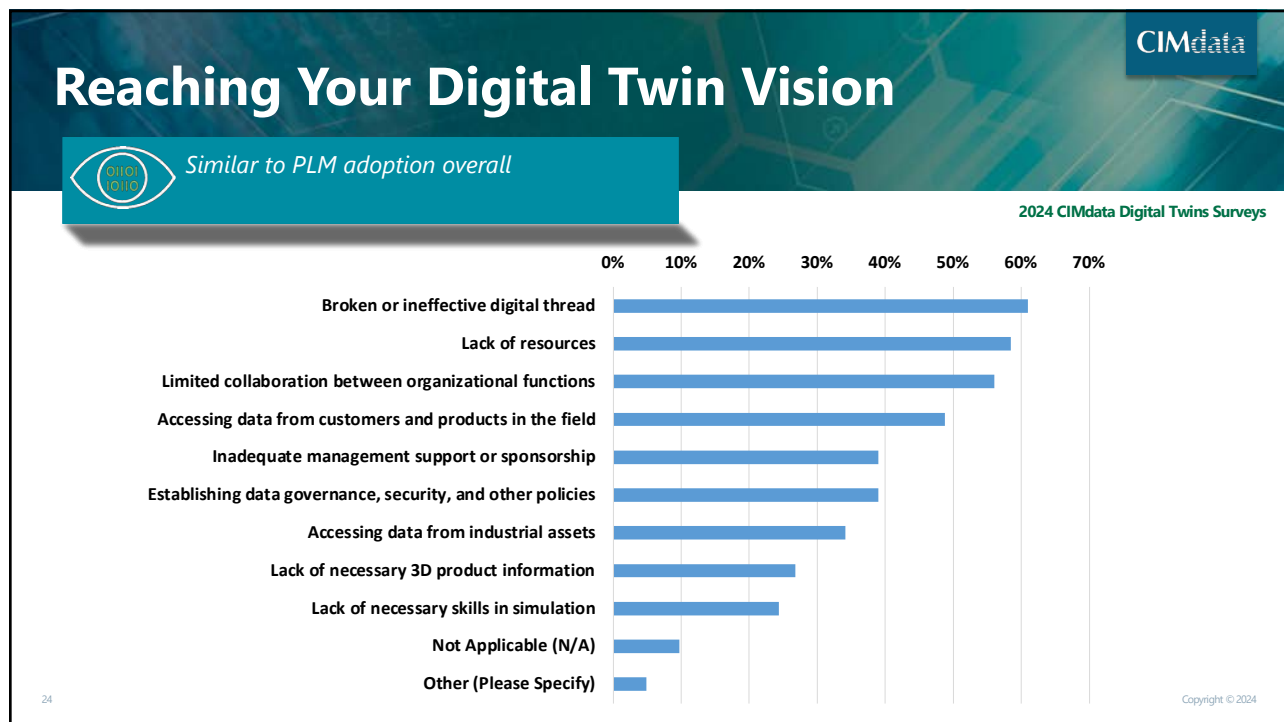
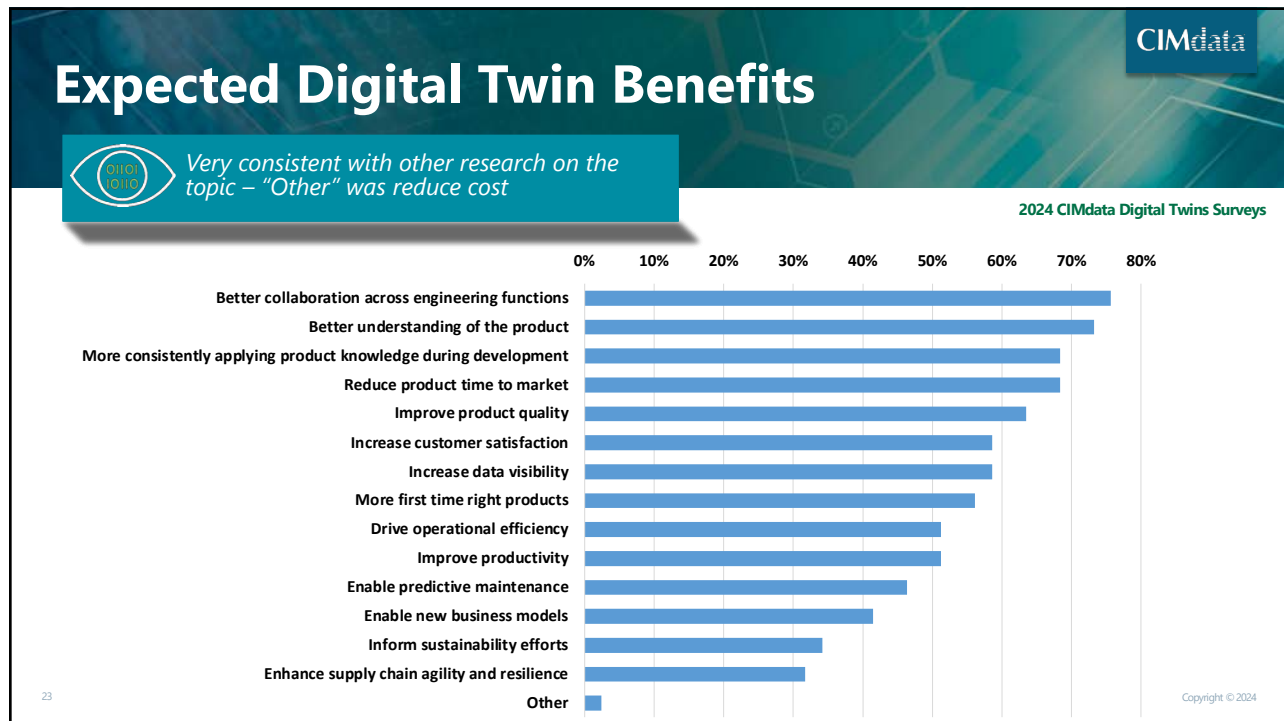
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Concluding Remarks



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- Most respondents plan a robust digital thread to support their digital twin efforts
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25

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Questions & Answers



What's on your mind?



26

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27

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28

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