



INFLECTION POINT FOR DIGITAL TWINS: DOMAIN SOLUTIONS TO ENTERPRISE VALUE

Carter Gordon, Industry Analyst
Ryan Martin, Senior Research Director



EXECUTIVE SUMMARY

CONTENTS

EXECUTIVE SUMMARY..... 1

**DIGITAL TWIN MATURITY GAP
EXPOSES SCALABILITY STRUGGLE 2**

**SCALE DIGITAL TWINS WITH AI,
AND AI WITH DIGITAL TWINS 4**

**ENTERPRISE-SCALE DIGITAL TWINS
DRIVE GREATER VALUE 5**

**MOVING FORWARD: SCALING
STRATEGY AND SUPPLIER CHOICE 6**

Digital twins are becoming an integral part of design, manufacturing, and service companies, but most deployments stop short of enterprise value. Awareness is not the problem—manufacturers across regions, industries, and sizes recognize the value of digital twins more than ever. Instead, the challenge is converting targeted deployments into ones that are connected and scalable.

Consider building digital twins as a maturity journey. Many digital twin deployments are immature, with a gap between turning domain-specific deployments into enterprise-wide connected assets. The maturity gap exists because manufacturers are building twins as domain tools, not enterprise systems. While a point solution can create local value and be a credible entry point, those that fail to connect multiple domains fail to drive holistic enterprise outcomes.

Produced in partnership with Siemens.

Current approaches to scale digital twins and connect isolated use cases hit a ceiling because they attempt to expand the scope of targeted projects, rather than building the foundation for a comprehensive digital twin. Expanding digital twins to include more isolated solutions or more department-level use cases does not build digital twin maturity.

Instead, leaders in digital twin maturity invest in both the data and interoperability foundation, as well as the organizational alignment required for enterprise-scale digital twins. This includes standardized data context and governance, a clear cross-functional ownership framework, executive sponsorship, and continuous feedback that promotes cross-lifecycle continuity.

Importantly, a successful digital twin maturity journey considers Artificial Intelligence (AI) and digital twins as a collective investment, where both are more effective together, rather than separate priorities.

AI will widen the gap between leaders and laggards, as successful manufacturers exploit the complementarity of digital twins and AI: leveraging digital twins to structure and connect lifecycle data, and AI to analyze, provide actionable insights, and evaluate business outcomes.

With digital twin adoption on the rise, the market is at an inflection point. Leaders must transition from adoption to connection, with the breadth of vendor support, including ecosystem reach and implementation support, more important than ever. As manufacturers progress on their digital twin maturity journey, the key supplier criterion for success will not be offering the most digital twin tools, but connecting product, production, operations, and service lifecycles.



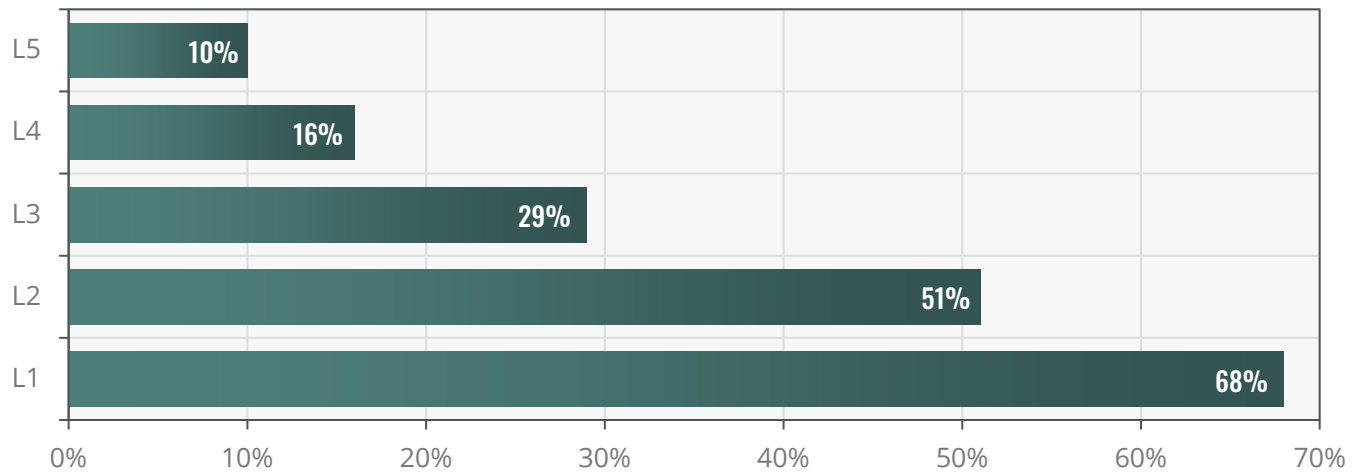
DIGITAL TWIN MATURITY GAP EXPOSES SCALABILITY STRUGGLE

The maturity of digital twins can be categorized by 5 levels:

- **Level 1:** Model-centric pilots
- **Level 2:** Multi-domain design
- **Level 3:** Bridging design and manufacturing
- **Level 4:** Closed loop production
- **Level 5:** Continuous, enterprise scale digital twins

Figure 1: Rollout, Scaling, or Fully Implemented Digital Twins by Level

(Source: ABI Research)



The hardest transition is moving from multi-domain design (Level 2) to bridging design and manufacturing (Level 3), as this step moves from engineering-centric to operational digital twins. The transition requires structured data management between design and production departments, and a framework that outlines digital twin ownership and coordinates goals as the technology spans domains.

The drop-off in Level 3 digital twin maturity underlines the importance of developing digital twins with long-term enterprise value in mind. Scaling digital twins means scaling the data, governance, and lifecycle connectivity that make digital twins enterprise assets.

Point solutions cannot extend easily into operations, so manufacturers struggle to scale digital twins that bridge design and manufacturing. Manufacturers that architect digital twins around integration, standardize data across the organization, and develop a system for cross-functional ownership ease the progression toward a connected enterprise-level digital twin.

The lack of data transfer across lifecycles also highlights a disconnect in the priorities of manufacturers. Only 14% of manufacturers transfer data and intelligence across lifecycles in a closed loop. Manual data orchestration breaks the digital thread, and makes it impossible for digital twins to expand beyond confined domains.

Digital twins, therefore, sit at the intersection of wider organizational software decisions. Digital twin software suppliers must be evaluated on their ability to develop a digital thread across the organization, including design and operations, as well as a commitment to supporting the maturity journey from pilot deployments to continuous digital twins



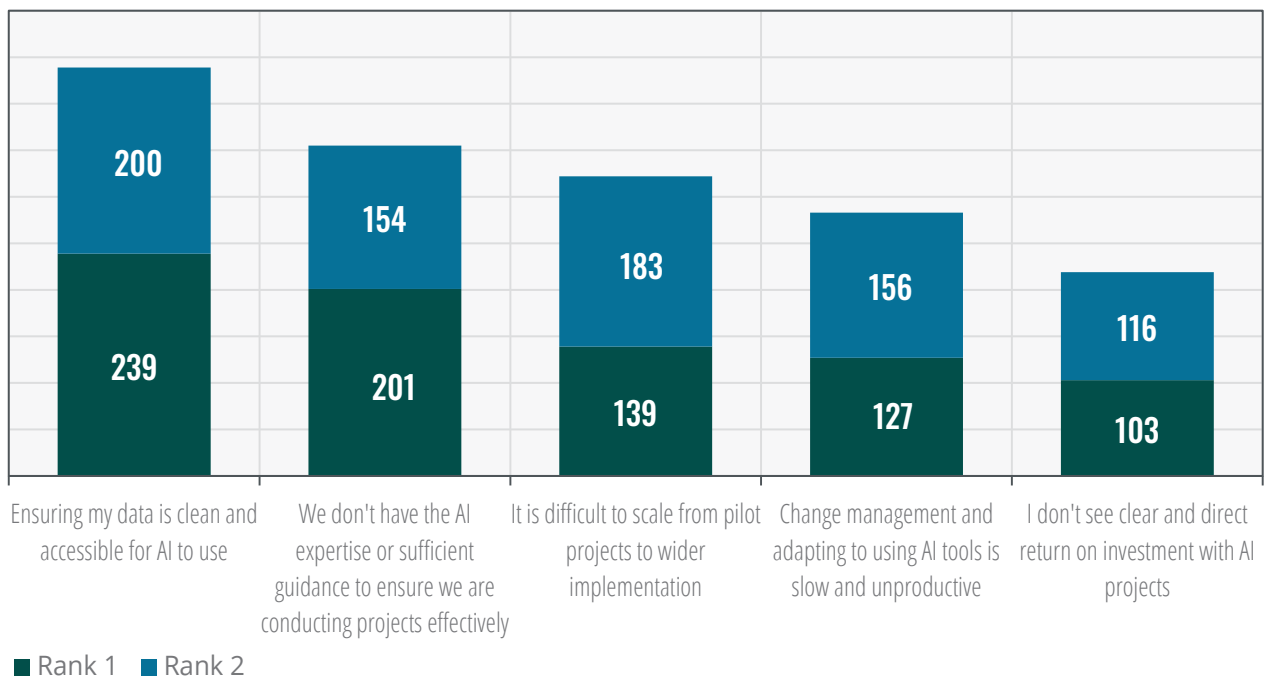
SCALE DIGITAL TWINS WITH AI, AND AI WITH DIGITAL TWINS

As manufacturers increasingly adopt digital twins, AI will be a differentiator that separates leaders from laggards.

Hesitancy around AI adoption is a symptom of a broader issue regarding a fragmented data foundation. Until manufacturers develop a continuous digital thread with structured data across the organization, AI will remain difficult to trust and scale. Digital twins provide the semantic backbone to equip AI with the contextualized data needed to drive reliable, actionable insights.

Figure 2: Challenges with AI Projects

Source: ABI Research)



Similarly, cost concerns around digital twins are rooted in Return on Investment (ROI) uncertainty. To gain confidence in ROI, manufacturers need to see consistent enterprise outcomes driven by connected digital twins: for example, linking a quality issue on the shop floor with a design decision made months earlier, not just flagging a Parts per Million (PPM) excursion. With a digital twin foundation, AI helps manufacturers move from passive monitoring to active decision-making, compounding the benefit of a connected digital twin.

AI is not yet practical for autonomous control. AI is, however, strong in understanding and anticipating issues. As digital twins provide context across product design and manufacturing, AI can help organizations explore more alternatives, evaluate likely outcomes, and identify opportunities for improvement more quickly.

AI without a comprehensive digital twin risks becoming an isolated analytics engine. Digital twins without AI risk remaining domain-specific representations. Successful manufacturers will architect the technologies together, with digital twins as a context layer and AI as an intelligence layer, compounding their benefits.



ENTERPRISE-SCALE DIGITAL TWINS DRIVE GREATER VALUE

The value of a digital twin increases as its application expands to enterprise levels. While a point digital twin solution helps manufacturers understand what is happening within a domain, a connected digital twin links decisions made in one domain to outcomes in another, allowing for cross-functional coordination that improves operations enterprise-wide.

Figure 3: Digital Twin Business Benefits in Operational Efficiency

(Source: ABI Research)

SEGMENT	UNITS	AVERAGE	MEDIAN
Time to Market (TTM) (% Faster)	(%)	44.1	36.0
Overall Equipment Effectiveness (OEE) (% Improvement)	(%)	20.8	15.0
First Pass Yield (FPY)/Scrap (% Improvement)	(%)	16.3	14.0
Unplanned Downtime (% Reduction)	(%)	29.9	26.5
Rework (% Reduced)	(%)	25.4	25.0
Energy/Carbon Dioxide (CO2) Emissions (% Reduced)	(%)	14.4	10.0
Warranty>Returns (% Reduced)	(%)	18.6	15.0
Change Order Management Cycle (% Faster)	(%)	38.8	25.0

Connecting upstream decisions to downstream outcomes is where manufacturing leaders see outsized benefits. Improvements in OEE and downtime reduction are significant at scale—indicative of improvements in processes and overall operations, not just instances.

Larger businesses see disproportionate benefits from connected digital twins. The increased benefit is not simply because of the size of operations, but because of the inherent investment required to build platforms that integrate and standardize governance across departments.

Based on a global survey of manufacturing decision makers, Small and Medium Businesses (SMBs) are more likely to use fragmented approaches to manage digital twins—a combination of file-based sharing, custom-built applications, or through structured versioning—because the scale of operations does not demand robust platformization to coordinate throughout the organization. While these approaches are sufficient for point digital twin solutions, creating a continuous digital thread and formalizing data-sharing are necessary steps to bridging digital twins across domains and achieving the benefits in operations.



MOVING FORWARD: SCALING STRATEGY AND SUPPLIER CHOICE

Manufacturers must start treating digital twins as an overarching transformation of how organizations, across engineering and operations teams, share data, add context, and make decisions.

The success of a digital twin deployment relies on a deliberate scaling strategy. Digital twins scale alongside the overall digital thread of an enterprise. Customers must establish a unified data foundation with shared context, plan ownership of digital twins across teams, and close the loop between lifecycles so data and intelligence from one product version informs the decision-making of future iterations.

Even with investment in digital threads, manufacturers must recognize that point solutions do not scale easily into enterprise digital twins. The benefits of digital twins are limited when they are designed for domains instead of upstream-to-downstream decision optimization. Integration and closed-loop connection between design and manufacturing must be the priority.

AI is the accelerator to realizing digital twin returns. The practical path forward uses digital twins for applying structure and context to data, and layering AI for predicting outcomes, generating recommendations, and continuously improving models. This mutually beneficial relationship makes each technology more effective and drives clearer, measurable business improvements.

Finally, choosing a supplier is a critical choice as manufacturers scale digital twins. No single solution offers a comprehensive digital twin out of the box. Instead, the most powerful solutions are those that can connect domains throughout the maturity journey from Level 1 (model-centric pilots) to Level 5 (continuous, closed-loop digital twins).

The challenge is not creating another digital twin. It is connecting decisions across engineering, production, operations, and service. This depth of integration and connectivity across domains is where Siemens is strongest. Fragmented alternatives may solve targeted problems but often reinforce the isolation that limits the value of digital twins.



August 2026
157 Columbus Avenue
New York, NY 10023
Tel: +1 516-624-2500
www.abiresearch.com

WE EMPOWER TECHNOLOGY INNOVATION AND STRATEGIC IMPLEMENTATION

ABI Research is uniquely positioned at the intersection of end-market companies and technology solution providers, serving as the bridge that seamlessly connects these two segments by driving successful technology implementations and delivering strategies that are proven to attract and retain customers.

©2026 ABI Research. Used by permission. ABI Research is an independent producer of market analysis and insight and this ABI Research product is the result of objective research by ABI Research staff at the time of data collection. The opinions of ABI Research or its analysts on any subject are continually revised based on the most current data available. The information contained herein has been obtained from sources believed to be reliable. ABI Research disclaims all warranties, express or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.