CIMdata

PLM Road Map™ & PDT EMEA 2026

AI in PLM: A Disruptive Opportunity and Challenge

*Turning AI disruption into enterprise value:*
*Strategic insights for the PLM professional*

CIMdata 4-5 November 2026 www.CIMdata.com

# AI in PLM: Beyond all the Hype

## PLM Road Map™ & PDT EMEA 2026

**4 November 2026—Gothenburg, SWEDEN**

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# CIMdata

Defining What Comes Next in Digital Transformation



# Our Services




### Market Intelligence & Analysis

Focused on technology evaluations and market-specific insights to guide investment.

### Knowledge & Best Practices

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### Strategic Guidance & Positioning

Specialized advisement in program management and organizational market positioning.

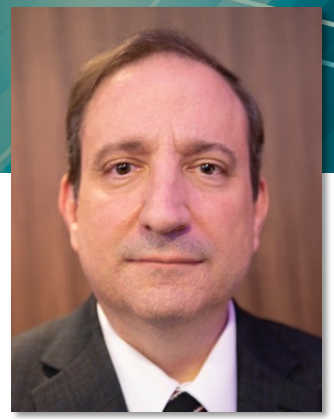
***Strategic advice & counsel through a comprehensive & integrated set of services***



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# Peter A. Bilello, President & CEO

*Professional background*



- More than 38 years of experience in the development of IT solutions for research, engineering, and manufacturing organizations worldwide
- Led numerous projects in PLM analysis, selection, implementation & management, synchronous and lean manufacturing consulting & software engineering, as well as general data management & governance strategy development and support
- Authored many papers & research reports on PLM and related topics, as well as numerous articles, commentaries, and perspectives that have appeared in publications throughout the Americas, EMEA & Asia
- Holds a B.S. in Computer Science (minor in Physics) & M.S.E. in Manufacturing Systems Engineering


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# Key Takeaways

**01**

### AI Isn't New to the PLM Industry

- AI has been present in the PLM market for years, but the impact of newer GenAI or yet to be defined AI capabilities remain unclear
- Many are still trying to understand, integrate & optimize product lifecycle enabling AI

**02**

### AI: Hype or Reality

- The hype around AI has been increasing
- Like most emerging technologies, AI is often hyped before its real value is fully understood
- AI is, for the most part, augmenting, not replacing humans in engineering & design

**03**

### The Real State of AI in PLM

- AI brings both challenges & opportunities
- AI usage has the potential for delivering significant & disruptive gains
- Since AI is often hyped before its real value is proven, understanding its status is helpful

**04**

### The State of Measurable Benefits

- Practical benefits related to AI exist, but many companies are struggling to understand where to best apply it for success
- The integration of AI into the product lifecycle is starting to reshape engineering & design practices

**05**

### Our Call to Action

- Our task, as PLM professionals, is to turn AI's disruptive power into value
- Humans need to assume the role of "curator" of AI generated content
- There is a clear need to communicate that AI doesn't work if the data it is using isn't valid


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# The AI Confusion Problem in PLM




*'I stopped understanding at synergistic agentic copilot.'*



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# The Perceived/Expected/Actual Impact of AI






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# The Perceived/Expected/Actual Impact of AI






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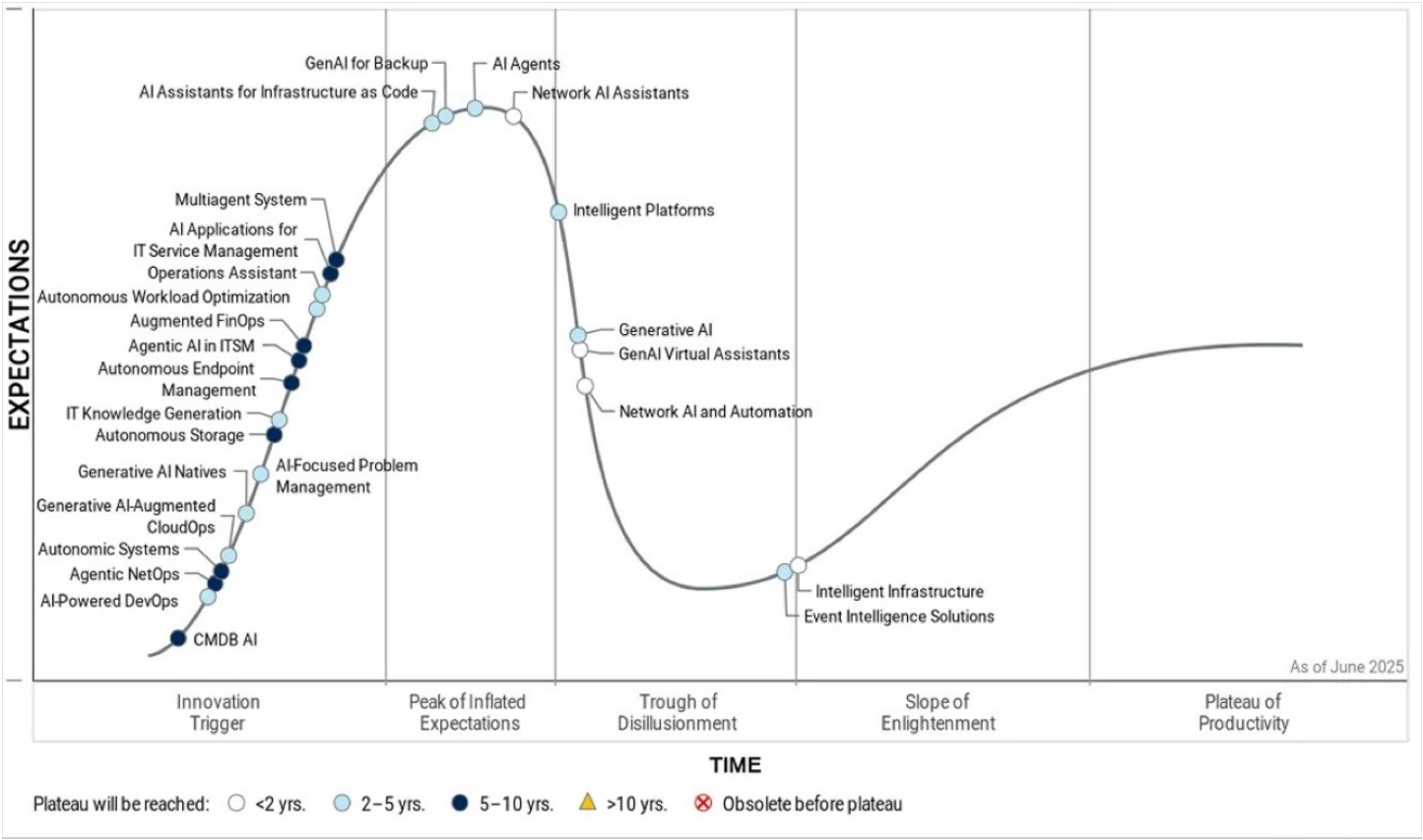
# The Perceived/Expected/Actual Impact of AI






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# We Know the Hype: We Are Living It



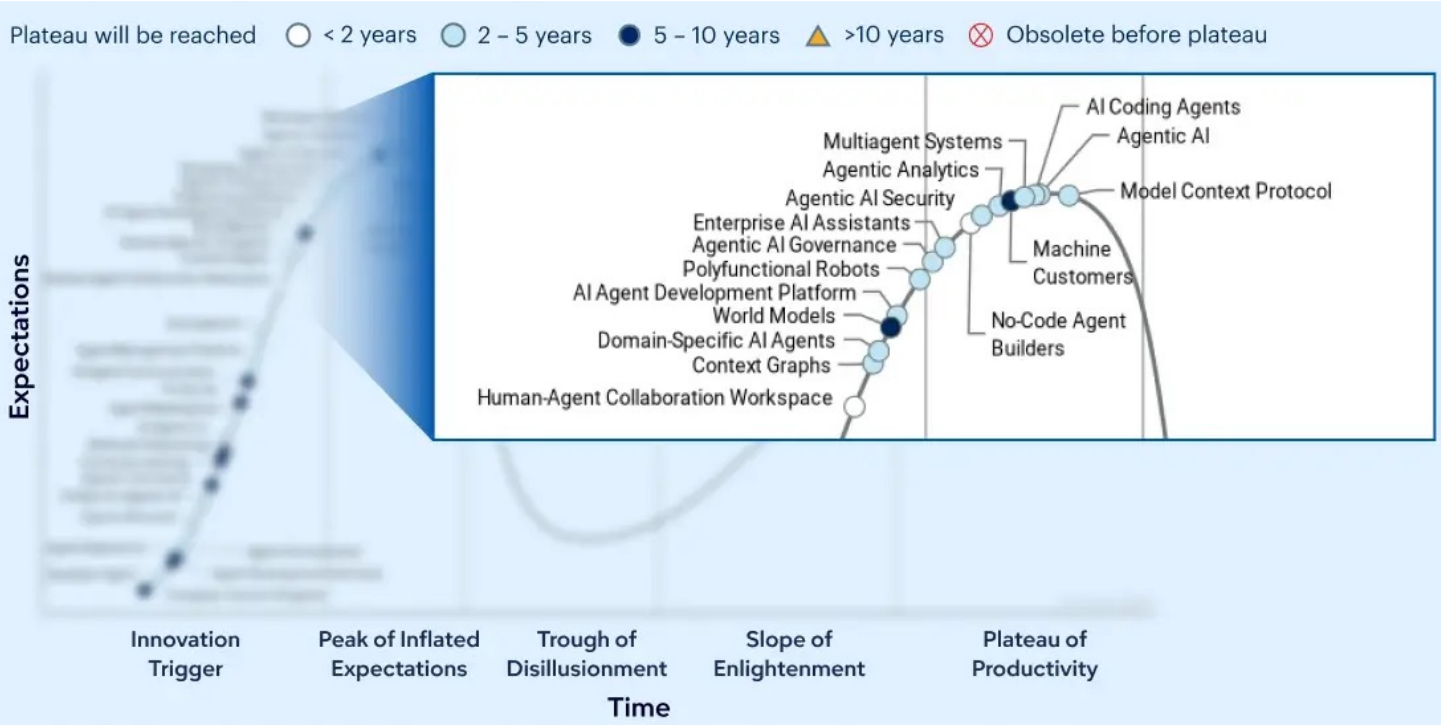

**Hype Cycle for AI in IT Operations**

2025 Gartner



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# Yet Another Measure

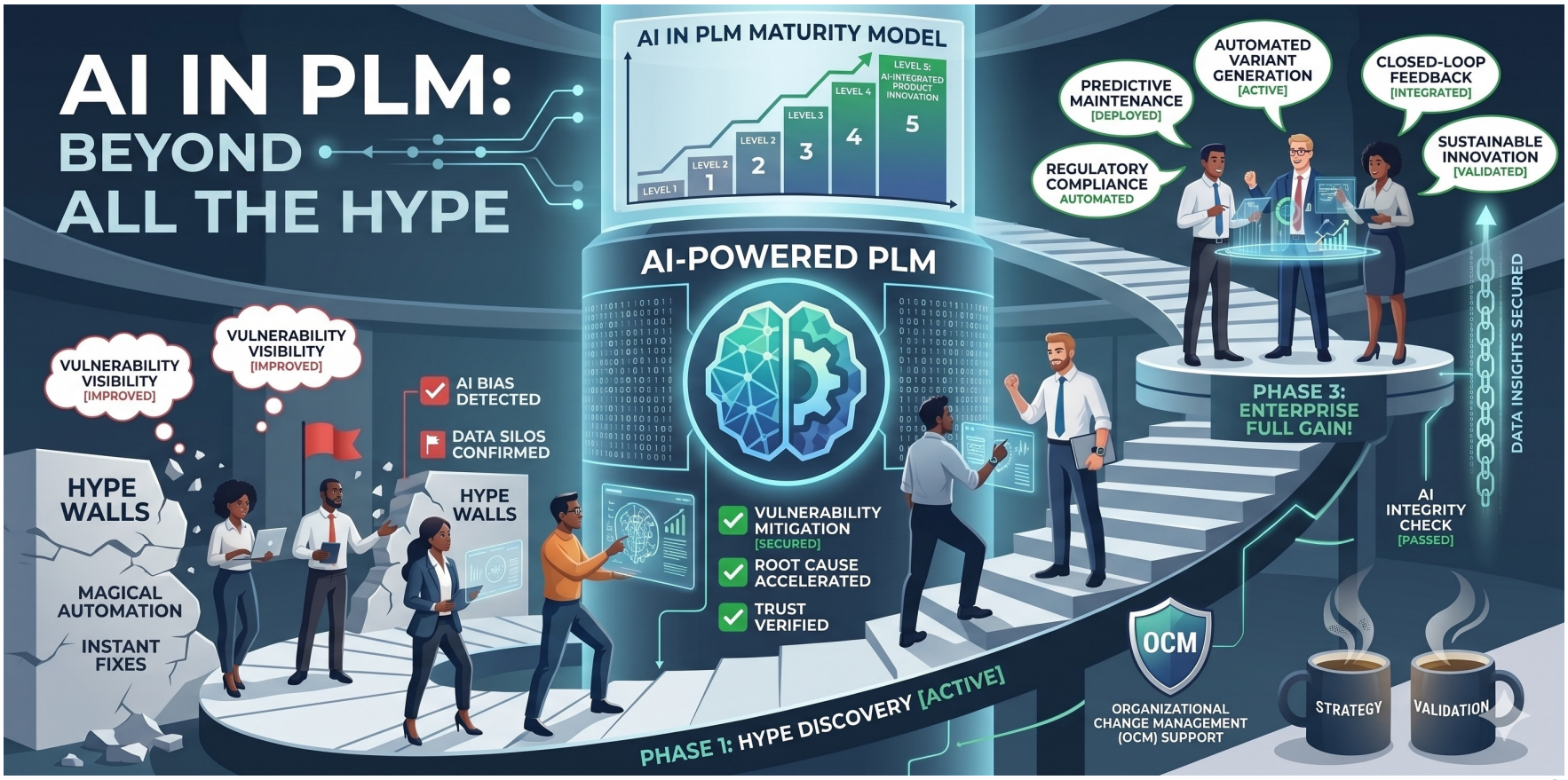



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**2026 Hype Cycle for Agentic AI**


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# We Must Find a Pathway Beyond the Hype

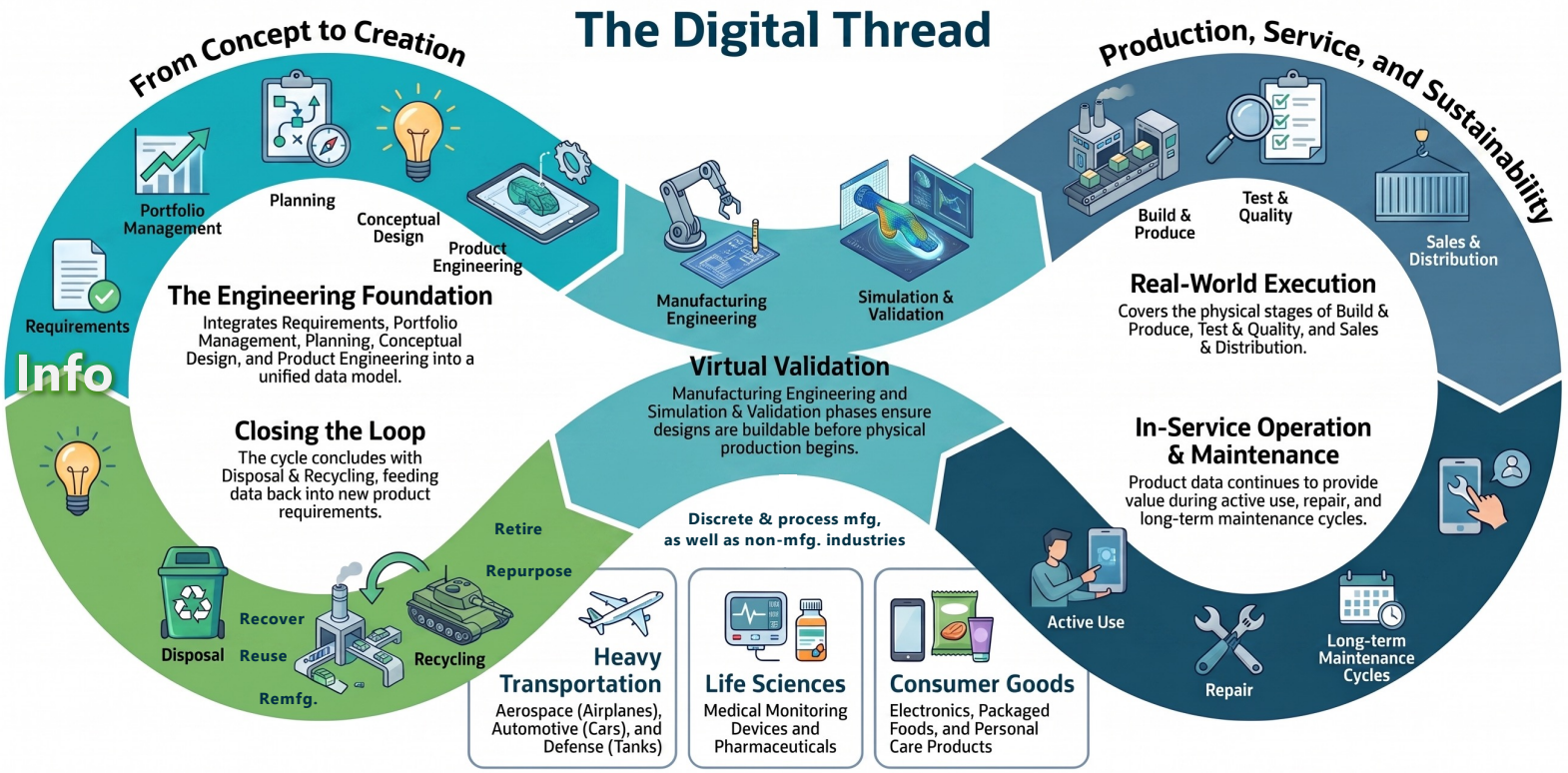





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# A Reminder: the Product is a Result of its Data

*The end-to-end product lifecycle demands configuration management enablement throughout*

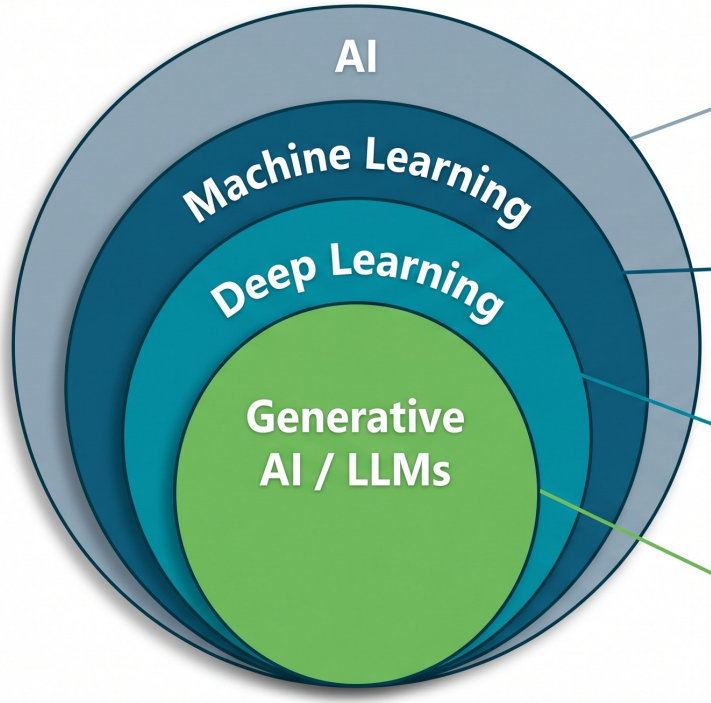





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# AI Basics: Today's AI Landscape

*AI → ML → neural networks → LLMs: one nested hierarchy*




**AI**
Rule-based systems, expert systems, optimization

**Machine Learning**
Regression, classification, random forests

**Deep Learning**
Neural networks, CNNs, transformers

*(CNNs = Convolutional Neural Networks)*

**Generative AI / LLMs**
GPT, Claude, Gemini, Llama

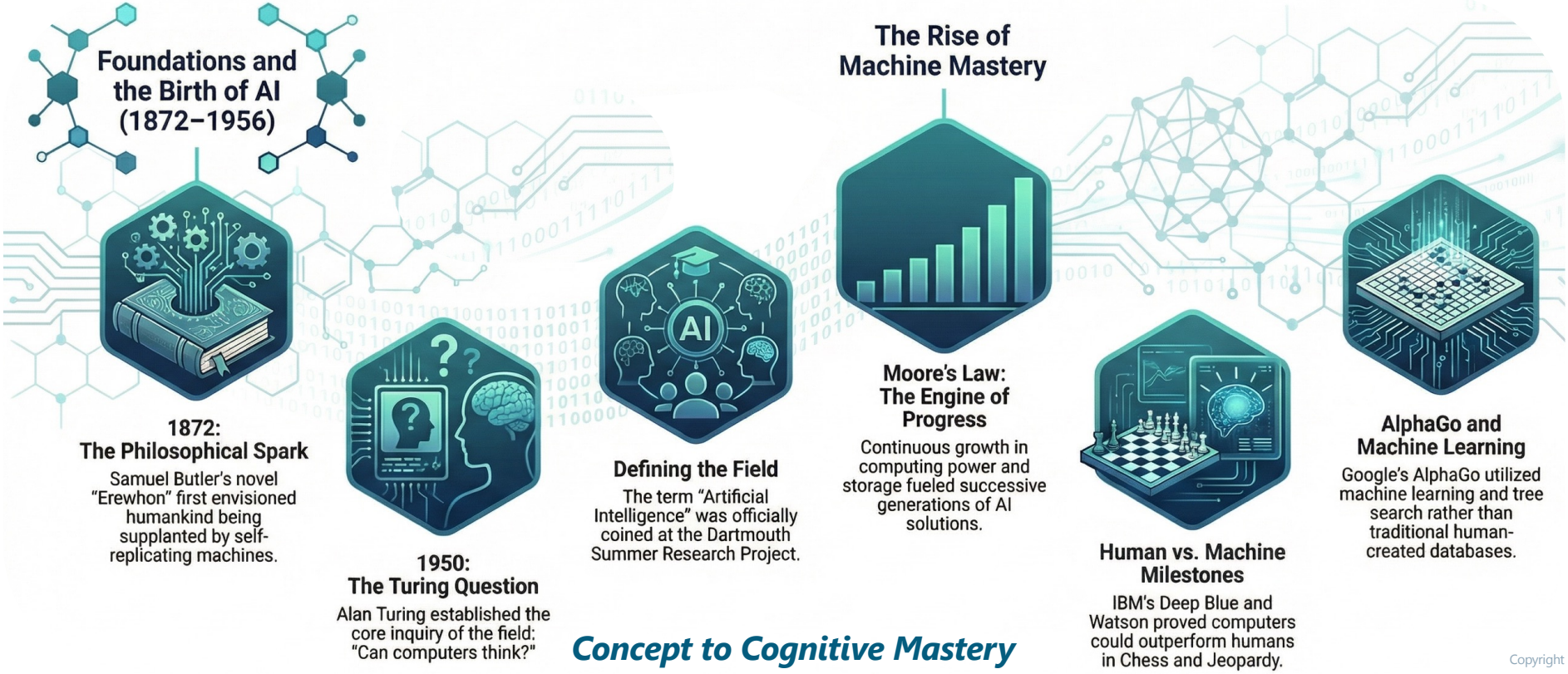
Each layer is a subset of the one outside it.



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# How Did We Get Here: The Evolution of AI

*This illustrates the journey of AI, starting with the 19th-century literature & progressing through the foundational work of Alan Turing and John MaCarthy. It highlights how Moore's Law fueled the transition from rule-based systems to modern ML models like AlphaGo.*

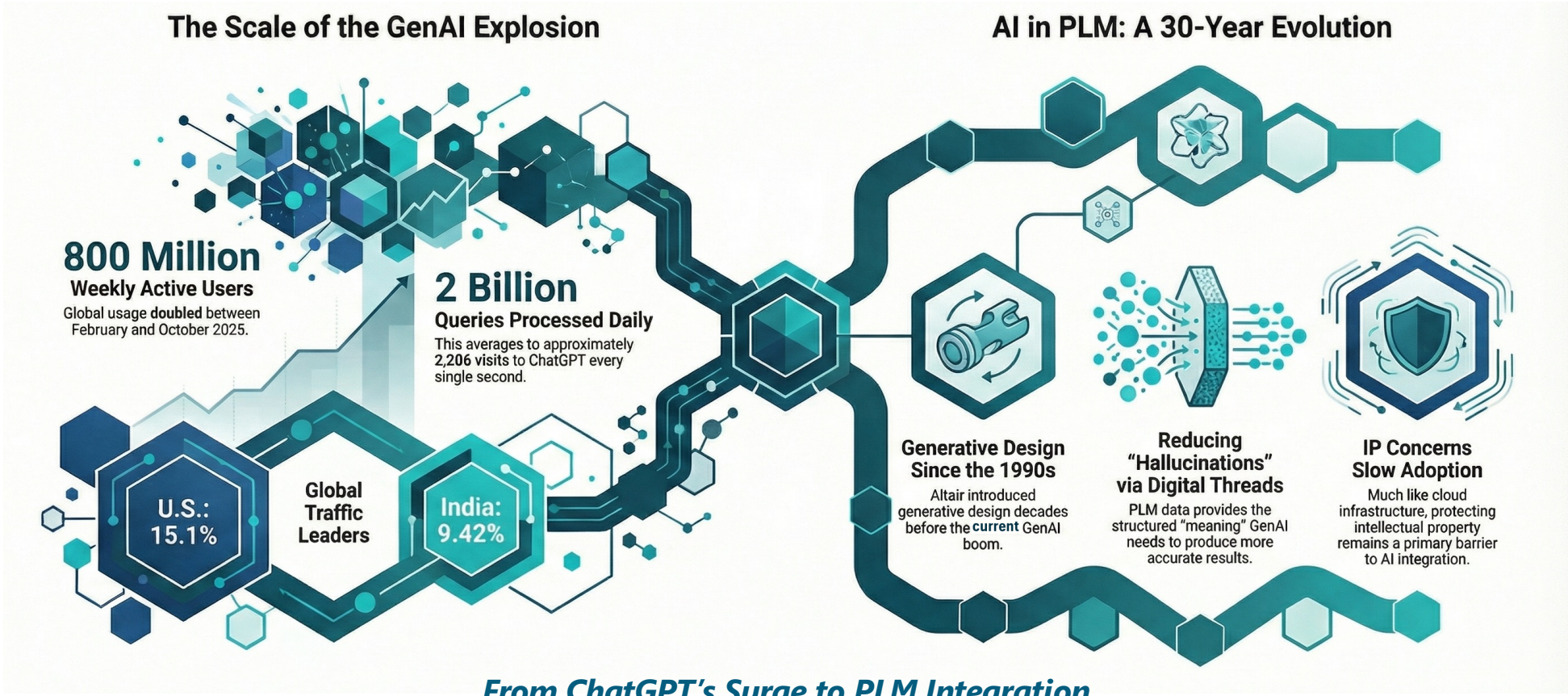



***Concept to Cognitive Mastery***



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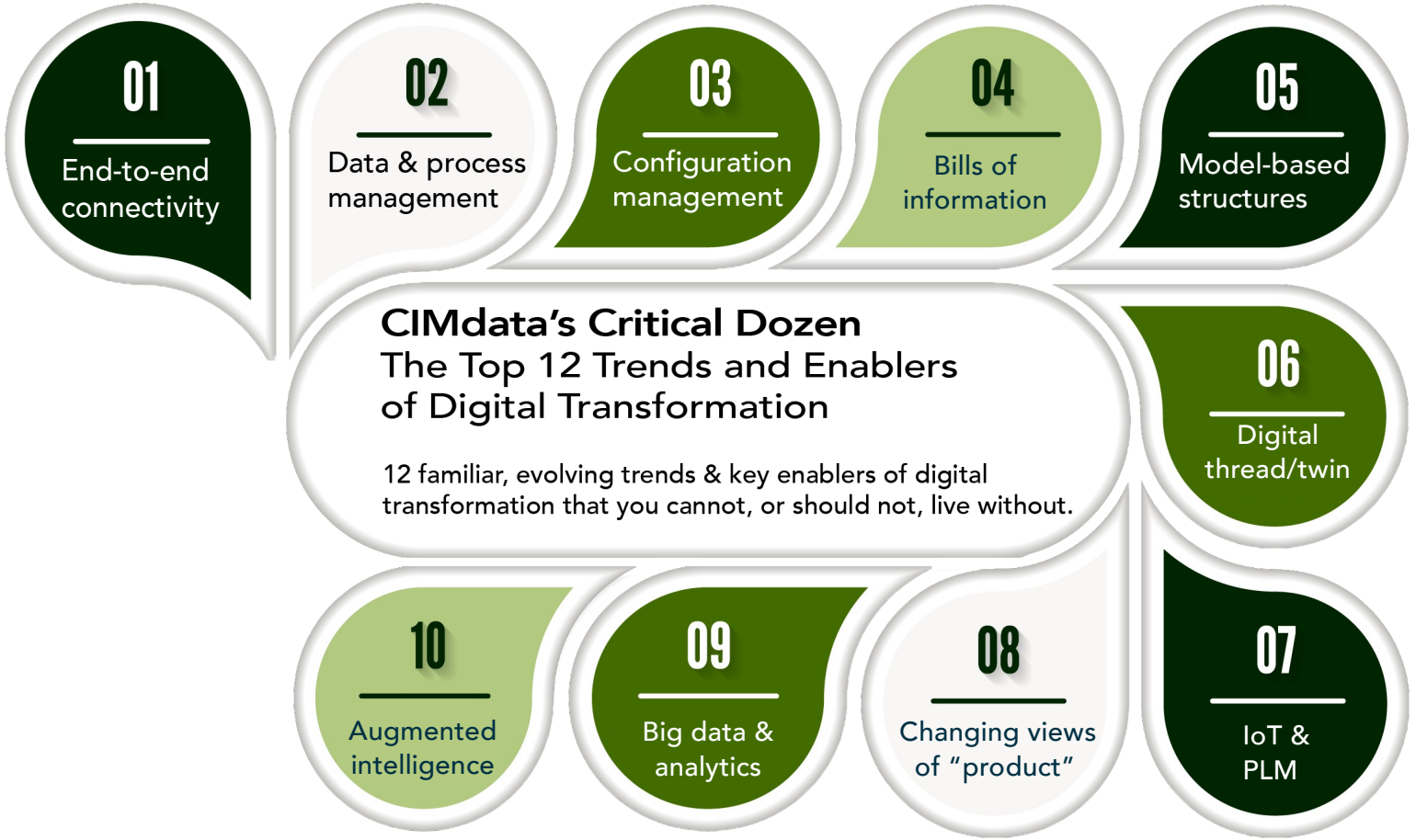
# The AI Revolution is Underway




***From ChatGPT's Surge to PLM Integration***


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# CIMdata's Critical Dozen






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# Augmented Intelligence

*Artificial Intelligence is expected to augment, not replace, human ingenuity in engineering & design*

10
Augmented intelligence

## Human



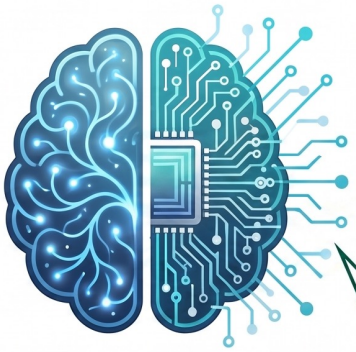
Organic Brain Pattern

### Core Ingenuity

**Augmenting Engineering & Design**

AI enhances human ingenuity in technical fields instead of substituting for it.

## Augmented



Half-Circuit / Half-Organic

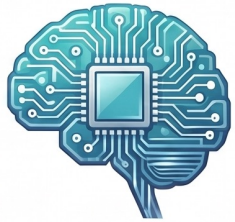
### Balanced Synergy

**Intelligence Augmentation (IA)**

Amplifying human intelligence by combining it with machine-driven data processing.

> **"AI won't replace managers, but managers who use AI will replace those who don't."**
>
> Erik Brynjolfsson and Andrew McAfee, HBR (2017)

## Artificial



Full Circuitry Pattern

### Data Processing

**Human-Machine Collaboration**

Using large data volumes to empower humans rather than replacing their core functions.



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# AI: From Disruption to Strategic Opportunity

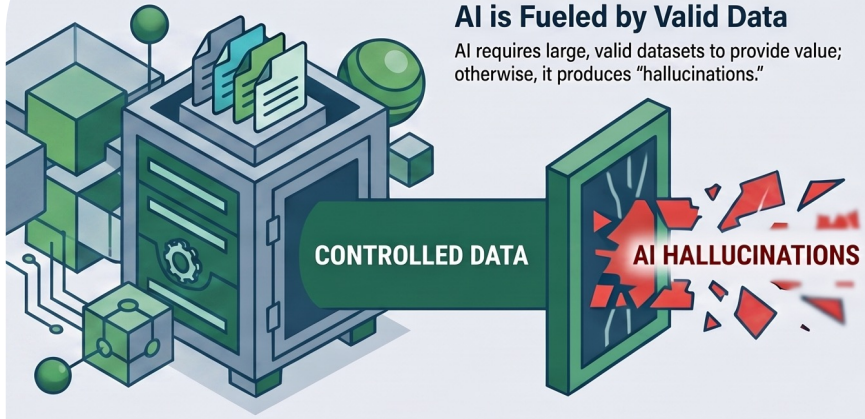
*AI opportunities across the product lifecycle*

*AI is reaching a tipping point in the PLM industry. The following outlines the critical necessity of high-quality, managed data to prevent AI "hallucinations" & highlights how genAI can transform lifecycle processes from document retrieval to digital twin management.*

## The Foundation: Data Integrity & Control

### AI is Fueled by Valid Data

AI requires large, valid datasets to provide value; otherwise, it produces "hallucinations."




### The Configuration Control Mandate

Lifecycle data must be under strict control or AI potential is greatly minimized.

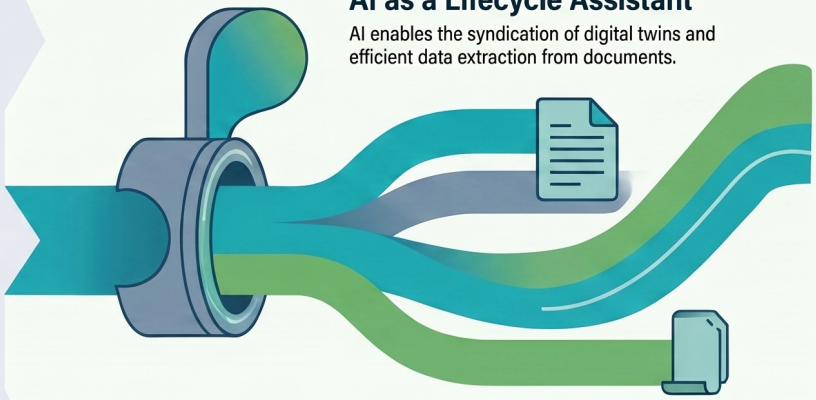
### Preventing Negative Value

Without large language models built on valid data, AI becomes a disruptor, not a tool.

## The Opportunity: Generative AI & Integration

### AI as a Lifecycle Assistant

AI enables the syndication of digital twins and efficient data extraction from documents.



### High-Quality Content Generation

Deep-learning models generate text, images, and content based on specific training data.

### The ChatGPT Turning Point

Organizations must now prepare to support and incorporate AI into lifecycle processes.



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# AI: Shaping the Future of the Lifecycle

*AI and automation are reshaping the engineering and design landscape, focusing on operational efficiency and necessary skill shifts.*

## AUTOMATION & WORKFLOW OPTIMIZATION



### Generative Design & Simulation

Enables engineers to explore a wider range of design possibilities and accelerated simulation.

### Real-Time Predictive Maintenance

Monitor asset performance in real-time to predict failures and enable proactive maintenance.

### Streamlined Collaborative Workflows

AI-powered assistants automate tasks from initial concept development through final manufacturing.

## THE EVOLVING ROLE OF THE PROFESSIONAL

Ai is fundamentally altering the engineering workflow by automating routine tasks and enabling advanced predictive capabilities, requiring professionals to move toward high-level problem-solving.





### Shift to High-Level Thinking

Professionals will focus on curation and complex problem-solving while AI handles routine tasks.





### Mandatory AI Literacy

Understanding AI principles and data interpretation is now a critical core competency.



### Adaptive & Personalized Systems

Design products that learn from user behavior and adapt to environmental conditions.



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# AI Enablement Evolving Rapidly



*Mindshare solution provider examples—PLM Mindshare Leaders—no one is standing still (1 of 2)*

- ***Aras***—AI is a seamless extension of their PLM environment
- ***Autodesk***—centered on the transition from CAD to AI-Assisted Design
- ***Cadence***—strategy is built on a unified big data analytics layer, JedAI
- ***Dassault Systèmes***—AI is the "brain" of the Virtual Twin
- ***Oracle***—System of Outcome driven by Agentic AI apps
- ***PTC***—for AI to be useful in an industrial/digital thread context
- ***SAP***—strategy, AI is relevant, reliable & responsible
- ***Siemens***—strategy focuses on Industrial AI
- ***Synopsys***—strategy is centered on a full-stack, AI-driven EDA suite


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# AI Enablement Evolving Rapidly

*Main Siemens PLM platform competitors—application enablement vs. AI platform approach (2 of 2)*

| Provider | Core Strategic AI Focus | Key AI Offerings | Primary Differentiator |
|---|---|---|---|
| **Siemens** | Industrial operational automation & shop-floor-to-cloud copilots | Siemens Intelligence Center X, Siemens Industrial Copilot, Senseye, TIA Portal Agents, app-embedded AI | Deep hardware-software integration & multiple hyperscaler alliances |
| **Aras** | Open model-driven data orchestration & low-code agentic AI | Aras InnovatorEdge, Variant BOM Agent, Low-Code APIs | Model-driven architecture exposing governed product data to external AI agents |
| **Dassault Systèmes** | Science-based Virtual Twins & generative physics ("3D UNIV+RSES") | 3DEXPERIENCE Generative Experience, multiple Assistants (bus., eng. & science) | Unified physics simulation (MOD/SIM) paired with proprietary knowledge graphs |
| **PTC** | Task-based engineering productivity & digital thread intelligence | PTC Intelligence Layer, PTC Orbit, PTC Jetstream, app-embedded AI | Direct embedding of agentic/generative AI into core PLM/BOM workflows |


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# What About AI On Top of a Data Platform




*A common enterprise approach for newcomers?*

- ***Amazon Data Zone***—a cloud-based data mgt. service that allows organizations to catalog, discover, share, and govern data at scale
- ***Snowflake***—a cloud-native data platform designed for data warehousing, analytics, and AI/ML workloads
- ***Databricks***—a unified, cloud-based Data Intelligence Platform designed for data engineering, analytics & AI
- ***Palantir Technologies***—builds platforms for big data analysis, integration, and decision-making

***Possible replacements, but does it make sense given all the embedded knowledge?***


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# Just a Few Questions to Ask Yourself



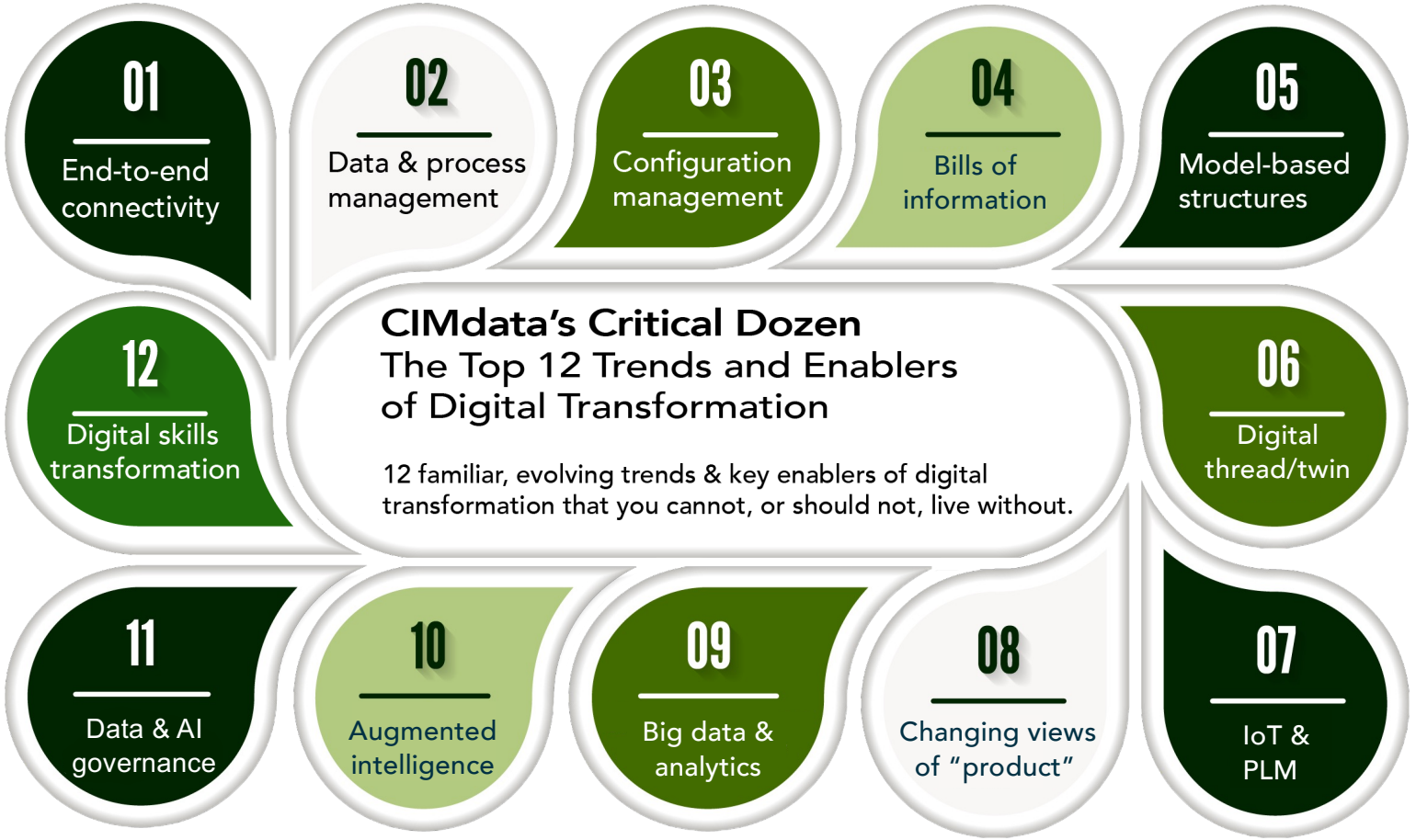
*The devil is in the details*

- Can today's PLM solution providers add value through AI enablement, and if so, will they be able to monetize it?
  - If they build it, will users follow?
- Will architectures change?
- Will the knowledge worker be replaced?
  - If so, who will the PLM solution providers sell to?
- Can complex PLM-related capabilities leave out the user?
  - And if they are left out, does that mean PLM solution providers will not be able monetize the use of their solution?



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# CIMdata's Critical Dozen






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# What We are Hearing…from the Field




*From the Industrial Community*

- What is AI, and is there a helpful framework?
- Where/how should I leverage AI?
- How do I control AI usage?
- What questions should I ask my solution providers?
- How much of AI is real and useful?
- Will AI require me to rearchitect my PLM environment?
- How do I incorporate our use of AI (e.g., from Google, OpenAI, MS) into our current PLM environment?


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# AI in Industry: A CIMdata Research Project

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**01**

### The Fluency–Deployment Divide

- **85%** use GenAI personally several times per week
- **58%** still in awareness or pilot at work
- **87.5%** have AI in fewer than 25% of projects

**02**

### Customers Are Bypassing Providers

- Only **8-33%** use provider AI
- **39%** build custom solutions
- **44%** prefer to lead internally

**03**

### Data Quality Is the Real Barrier

- **60%** cite data quality as top adoption challenge (at #1)—identical across customers and service providers
- Only **23%** cite ROI

**04**

### Validation Confidence Is Near Zero

- Only **5%** are very confident in validating AI outputs
- **68%** cite IP protection as top governance concern

**05**

### The Innovation Disconnect

- **28%** of customers and **36%** of software providers report innovation as a realized benefit of AI
- However, **0%** of software providers expect customers will prioritize AI for innovation over the next 2-3 years

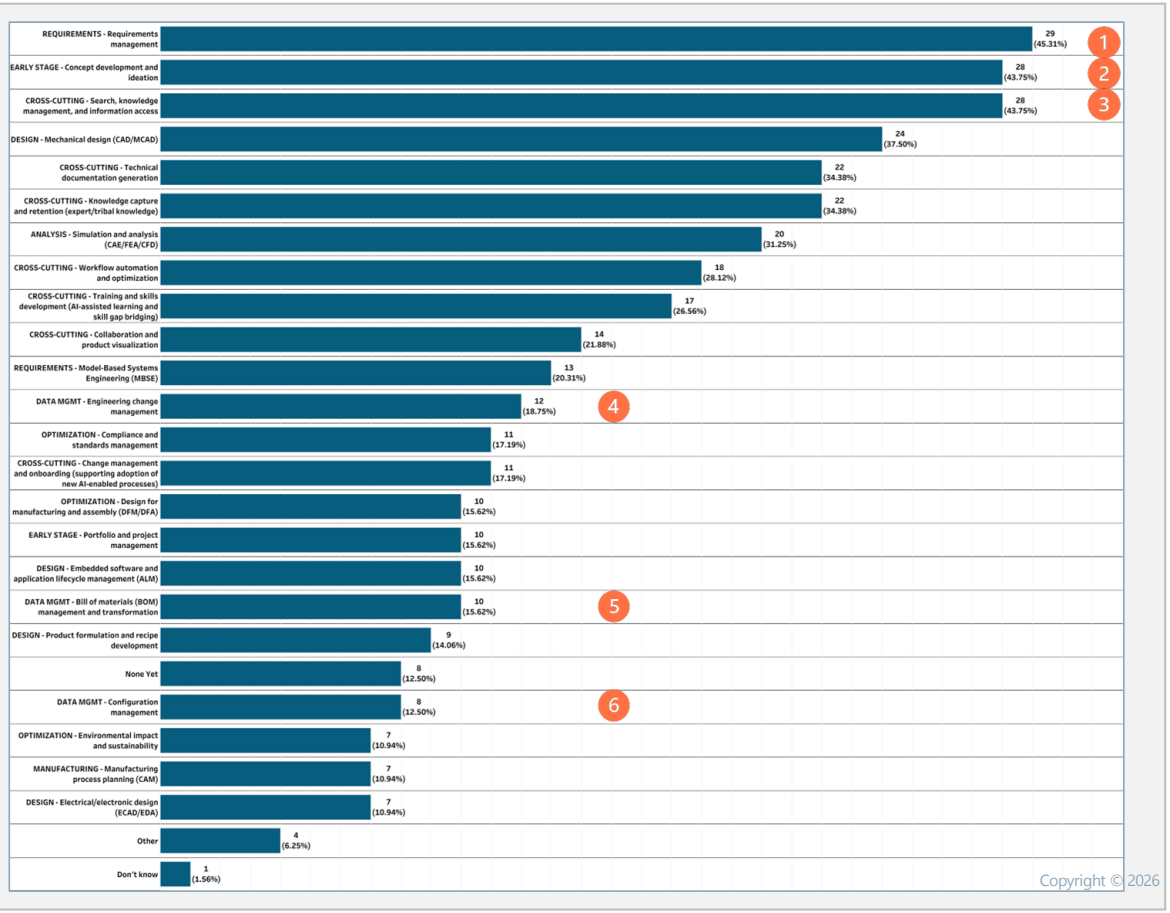


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# Where AI is Being Applied Today

**IC_02: Application Areas:** In which product development areas is your organization using or piloting AI today? (select all that apply)

- Early-stage use cases dominate:
  - Requirements (**45%**)[1]
  - Concept development (**44%**)[2]
  - Search/knowledge (**44%**)[3]
- Data management nearly untouched:
  - ECM (**19%**)[4]
  - BOM (**16%**)[5]
  - Config (**13%**)[6]



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# AI Maturity: No Area Reaches the Midpoint

**IC_12:** Organizational Maturity: Rate your organization's maturity in these areas

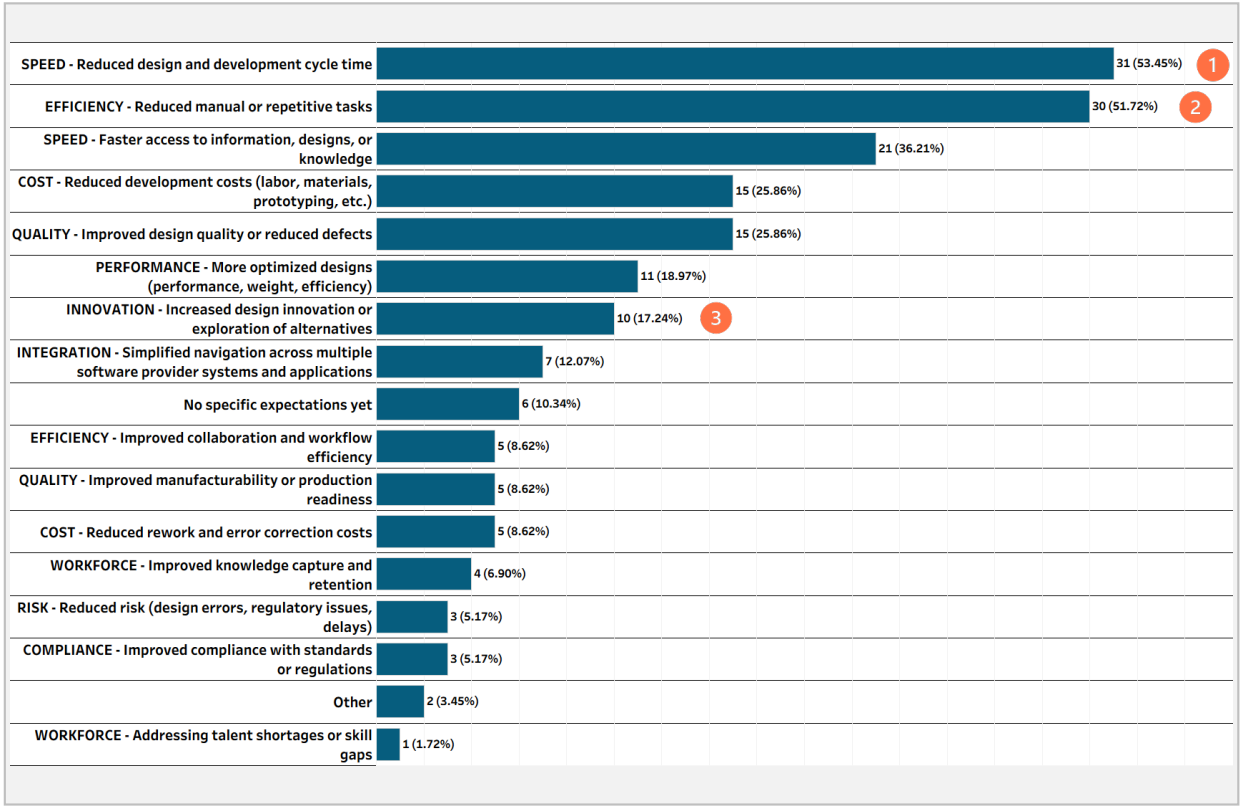
| | 1. Not developed | 2. Initial/Ad hoc | 3. Developing | 4. Defined/ Managed | 5. Optimized/ Leading | Don't know |
|---|---|---|---|---|---|---|
| AI strategy and planning | 10 (16.13%) | 14 (22.58%) | 24 (38.71%) | 7 (11.29%) | 4 (6.45%) | 3 (4.84%) |
| Change management for AI adoption 1 | 13 (20.97%) 2 | 28 (45.16%) | 9 (14.52%) | 7 (11.29%) | 3 | 5 (8.06%) |
| Data engineering and infrastructure | 8 (12.90%) | 16 (25.81%) | 20 (32.26%) | 14 (22.58%) | 2 (3.23%) | 2 (3.23%) |
| Data quality and governance | 8 (12.90%) | 17 (27.42%) | 27 (43.55%) | 8 (12.90%) | 1 (1.61%) | 1 (1.61%) |
| Product development domain knowledge 4 | 8 (12.90%) | 15 (24.19%) | 19 (30.65%) | 11 (17.74%) | 8 (12.90%) | 1 (1.61%) |
| Technical AI skills (data science, ML) | 6 (9.68%) | 16 (25.81%) | 24 (38.71%) | 13 (20.97%) | 2 (3.23%) | 1 (1.61%) |

- Change management is the weakest dimension at **2.18/5**[1] – **66%**[2] at Initial/Ad-hoc, **zero**[3] at Optimized.
- Domain knowledge leads at **2.93**[4].
- No dimension exceeds the midpoint of the scale.

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# What Customers Expect Next

**IC_16: Expected Benefits:** Which benefits from AI in product development does your organization expect to prioritize over the next 2-3 years? (select top 3)




- Reduced cycle time (**53%**[1]) and reduced manual tasks (**52%**[2]) lead IC forward expectations.
- Innovation ranks 7th at **17%**[3] – even though customers are already realizing it at **28%**.

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# CIMdata's Comments




*We appear to be at the tipping point*

- The integration of artificial intelligence (AI) into the product lifecycle is starting to reshape engineering & design practices
- AI is, for the most part, augmenting, not replacing human ingenuity in engineering & design
- Humans need to assume the role of "curator" of AI generated content
- Professionals who embrace AI & adapt to the changing landscape will be well-positioned to thrive in the years to come
- Much of the hype over AI's potential replacement of enterprise software hasn't considered PLM's enterprise role


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# Key Steps to Success

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**01**

### Start from the business need, not the AI

Technology looking for a problem is the classic failure.

**02**

### Don't wing it, but don't wait

Be disciplined about the work and still move soon—the clock is running.

**Assume your competitors are already doing it!**

**03**

### Be disciplined about how you choose

Screen out poor fits, match to what AI does well, score, and prioritize by fit, complexity / readiness, and value.

**04**

### Avoid the traps

AI is statistical, not deterministic—poor at exact answers, true cause, and spatial reasoning. Projects stall on data, skills, metrics, governance, and integration.

**05**

### Buy or build is a spectrum

From a finished solution you buy to one you build at increasing effort and ownership—check what you already own first.



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# Don’t Forget Digital Adoption Challenges

## TECHNICAL & OPERATIONAL HURDLES



### Siloed Data & Integration Gaps

Advanced manufacturing needs integrated data, but information remains trapped in separate, uncoordinated systems.



### The Legacy Infrastructure Burden

Outdated manufacturing assets lack the modern connectivity and cybersecurity required for AI readiness.



### Lack of Unified Standards

Inconsistent datasets and a lack of standards cause system incompatibility and design inefficiencies.

## STRATEGIC & WORKFORCE BARRIERS



### Supply Chain Blind Spots

Limited visibility beyond second-tier suppliers exposes the ecosystem to unknown risks and vulnerabilities.



### A Critical Skilled Labor Shortage

An aging workforce and lack of training hinder the expansion of domestic manufacturing.



### Uncertain ROI for Digital Adoption

High costs and a lack of standardized frameworks make it difficult to prove business cases.



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# Concluding Remarks

1. **AI has been present in the PLM market for years**
   But the impact of newer GenAI or yet to be defined AI capabilities remain unclear—leaders are acting now—planning & flexibility will be key

2. **Practical benefits exist**
   But many companies are still working to understand, integrate & optimize AI—don't forget about the data

3. **CIMdata expects AI in PLM is bringing both challenges & opportunities**
   Potential for significant & disruptive gains if managed well

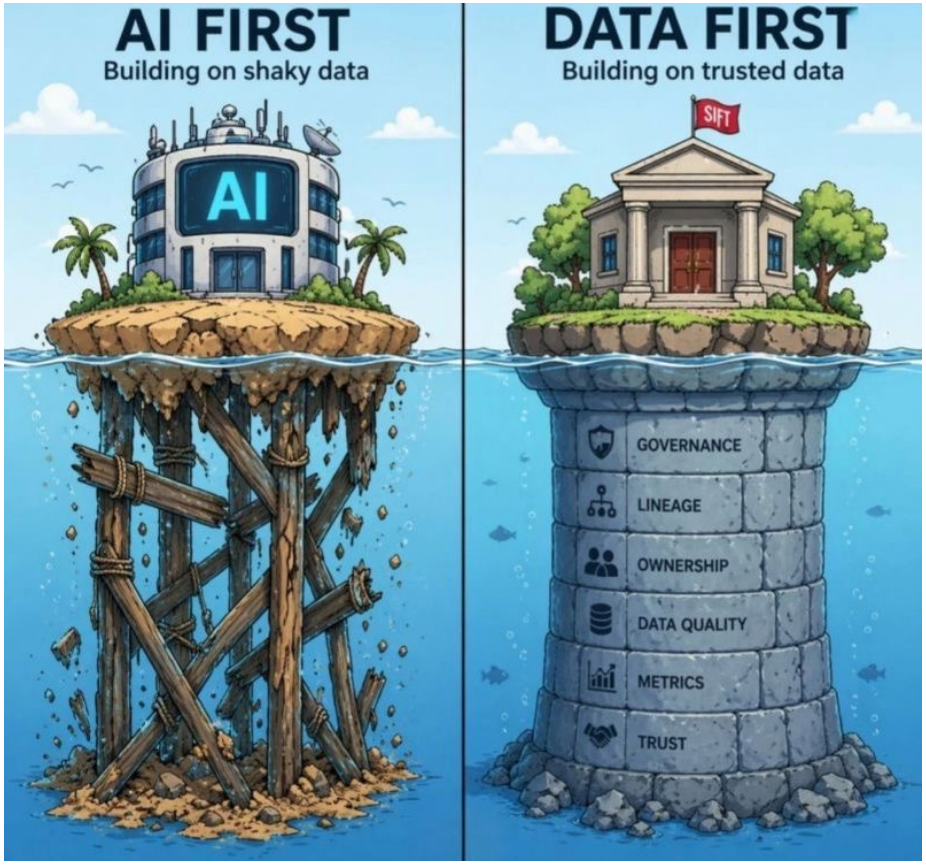
4. **Unfortunately, AI is often hyped before its real value is proven**
   Focus on value-added user stories and don't try to do everything at once

5. **The task for PLM professionals is to turn AI's disruptive power into enterprise value**
   The future is bright, with AI PLM-enabling agents & assistants becoming common place—it's all about the data

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# Final Thought

***What do you want to build your business on?***






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# Questions & Answers

*What's on your mind?*





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