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PLM Road Map™ & PDT North America 2026

AI in PLM: A Disruptive Opportunity and Challenge

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

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CIMdata

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APPLYING AI TO THE DIGITAL THREAD IN MBSE-DRIVEN ENGINEERING

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THE CHALLENGE

AI underdelivers when MBSE context is disconnected

- Requirements, system relationships, configurations, and outcomes are often fragmented across tools
- Engineering meaning is lost when lifecycle context is disconnected
- AI outputs become difficult to trust, explain, and operationalize
- The result is isolated productivity gains instead of system-level value

Not a lack of AI models.

A loss of structured system context.

STRATEGIC IMPERATIVE

AI-readiness must be designed into MBSE-driven engineering

01

Structured system context from MBSE-driven engineering

Build APIs, data contracts, and standards that let lifecycle systems share context reliably across engineering, manufacturing, and test.

02

Governed interoperability across lifecycle domains

Invest in data quality, structure, and completeness before deploying AI. Weak data foundations produce unreliable AI reasoning.

03

Strong lifecycle data foundations

Link requirements, decisions, configurations, processes, and outcomes so AI can follow relationships across the full lifecycle.

04

Controlled Access to Context, relationships, and business logic

Give AI access to business logic, traceability, and contextual relationships — not just raw records.

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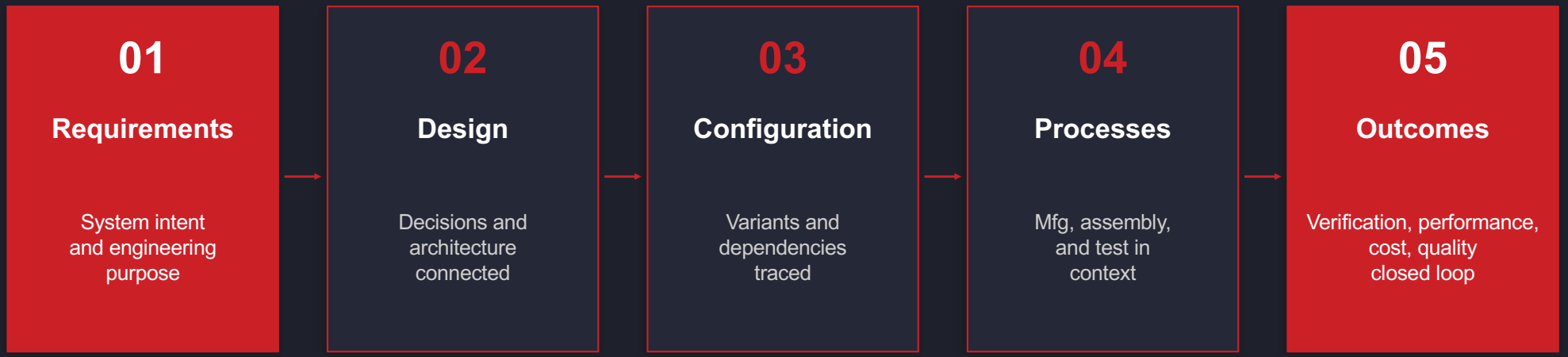
THE DIGITAL THREAD

The digital thread carries MBSE context across the lifecycle



AI does not create lifecycle meaning — it needs that meaning to already exist in the environment.

MBSE-DRIVEN ENGINEERING

Provide AI a system-level frame of reference

MBSE contributes structured system context — requirements, relationships, configurations, and behavior — that gives the digital thread more engineering meaning.

Requirements & Intent

Structured models of what the system must do — captured formally and linked to decisions.

System Structure & Behavior

Architecture and behavioral models that give AI relational context for engineering reasoning.

Configurations & Dependencies

Formal variant and dependency structures enable confident AI assessment of change impact.

Execution & Outcomes

Modeled intent connected to downstream results — AI can reason from design through delivery.

GOVERNANCE FOUNDATION

Governed Context Makes MBSE-aligned AI Trustworthy

01

Intentional

AI access is purposefully scoped to relevant lifecycle data

02

Governed

Policies define what AI can see, use, and act upon

03

Secure

Data is protected and access-controlled across the thread

04

Traceable

Every AI-influenced decision is auditable back to its source

05

Explainable

Humans stay accountable; AI reasoning is understandable

Trusted context is more valuable than uncontrolled access.

LIFECYCLE INTELLIGENCE

AI can reason across the same structure engineers use to define and evaluate a system

From productivity assistance to lifecycle intelligence.

AI value scales with the quality of lifecycle context.

Requirements and system intent

Interpret, connect, and assess engineering intent, understanding what was decided and why.

Configurations and dependencies

Analyze dependencies, variants, and change impact across complex engineering structures.

Execution Processes

Support workflows across manufacturing, assembly, and test with contextual awareness.

Verification and Lifecycle Outcomes

Relate decisions to performance, cost, quality, and downstream operational results.

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PROOF POINT

A Federally Funded R&D Center

Complex engineering, defense systems, and mission-critical outcomes.

AI readiness is built through digital preparation, not added through AI alone.

What They Built

1. Years of deliberate digital preparation to become AI-ready — not a quick deployment
2. Governed interoperability and strong lifecycle data foundations across systems
3. Connected engineering with manufacturing, assembly, and test environments
4. Low-code extensions to broaden PLM reach without heavy customization or technical debt
5. **AI enabled to reason across requirements, configurations, processes, and outcomes**

THE PATH FORWARD

AI advantage comes from MBSE structure, digital thread continuity, and governed reasoning

01 **Strengthen the digital thread** — provide system context AI can reason across.

02 **Bring structured engineering workflows into the lifecycle** — through MBSE-driven engineering practice.

03 **Govern how AI interacts with data, process, and decisions** — make AI usable, accountable, and trusted.

AI becomes more valuable when it can reason across a governed digital thread.

Thank you!

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