Digital Thread Implementation Checklist

'Nine Nights' Checklist: Conquering the Demons preventing your Digital Thread Success

This checklist is a high-value asset that helps Engineering and IT leaders self-assess their Digital Thread maturity and identify the immediate, high-priority failure points. For context, visit this _blog-post._

The 'Demon' (Failure Point)	Challenge Description	PLM/Digital Thread Counter-Strategy	Maturity Check (Score 1-5)	Action Priority (H/M/L)
1. Isolated Engineering(Data Silos)	CAD, PDM, and simulation data live only on local drives, invisible to Manufacturing/Service.	**Implement a Unified PLM Backbone** (e.g., Teamcenter) to manage all product data from concept to retirement.		
2. The Legacy Trap (System Fragmentation)	Relying on disconnected ERP, MES, and PLM systems with complex, brittle integrations.	**Standardize on a Model-Based Enterprise (MBE)** approach, making the digital model the single source of truth for all systems.		
3. Disconnected Quality (Non-Compliance Risk)	Quality and Non-Conformance data (NC/CAPA) is managed in spreadsheets or separate QMS, not linked to the design record.	**Integrate QMS with PLM (Closed-Loop Quality)** to instantly trace failure mode (NC) back to the design/process record.		

4. The Data Swamp (Lack of Governance)	No clear ownership, standards, or lifecycle management for critical datasets.	**Establish a formal Digital Thread Governance Council** with clear roles for data architects and quality gates at every phase.		
5. Low User Adoption (The Skepticism Wall)	Poor UI/UX, inadequate training, leading to engineers bypassing the formal PLM process.	**Focus on User-Centric PLM Design** and gamified training, demonstrating clear personal value (less manual data entry, faster search).		
6. The OEE/IIoT Gap (The Shop Floor Blind Spot)	IIoT sensors generate data, but it's not contextualized against the **BOM, Process Plan, or Tooling record** from PLM.	**Implement Manufacturing Execution (MES) Bridge** that feeds *contextualized*OEE data (Machine Downtime → Specific Operation ID) back to PLM for design/process lessons learned.		
7. The Compliance Headache(Untraceable Parts)	Inability to instantly trace every physical part (in Aerospace/Defense) back to its specific design revision, manufacturing instructions, and material certificate.	**Mandatory Digital Part Passporting**, linking serial/lot number to the authoritative e-BOM, m-BOM, and process plan within PLM.		
8. The Unscaled Process(Manual Handoffs)	Relying on documents, PDFs, and email handoffs between Engineering and Manufacturing.	**Implement Model-Based Definition (MBD)**and a centralized Manufacturing Process Management (MPM) solution integrated with PLM.		
9. The Vision Void (Lack of Strategy)	Implementing point solutions (e.g., new PDM) without a clear, multi-year roadmap for the end-to-end Digital Thread.	**Develop a Phased, Value-Driven Digital Thread Roadmap** aligned with top-line business goals (e.g., 20% faster NPI, 15% reduction in scrap).		

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