Product Wellbeing Maturity Stages

Ad Hoc – Vault Management

The first stage emphasizes foundational file storage and retrieval. The PLM system is a secure data vault that centrally stores CAD models and drawings. This provides a single repository where users check files in and out, maintaining version control and preventing overwrites. Centralizing product files enables teams to access and share up-to-date information more efficiently, reducing errors and enhancing collaboration. Operationally, this stage introduces essential control over engineering data but remains limited to file management without formalized product structures or workflows.

Product Wellbeing Maturity Stages

Organized – Product Data Management

In the second stage, the system implements structured data management on top of the file vault. Product information is organized into items with attributes and relationships, while Bills of Materials (BOMs) can be captured alongside CAD data. Engineers can link drawings, models, and documents to items, establishing a single source of truth for product definitions. This stage often includes an initial integration with ERP systems to share key data (such as item numbers and BOMs) for manufacturing. As a result, engineering and operations become more connected; for example, a released BOM can be transferred to procurement or production, reducing manual data re-entry. Basic PDM enhances data consistency and traceability within engineering, laying the groundwork for controlled product structures and cross-department collaboration.

Product Wellbeing Maturity Stages

Integrated – Product Change Management

The third stage adds formal change control processes into the PLM environment. Organizations build on the PDM foundation and establish structured workflows for managing design modifications and product updates. Standard change objects – such as Problem Reports, Product Change Requests, Product Change Orders, and Product Change Notices – are introduced to ensure that every change is documented and approved. The PLM system offers built-in governance and visibility, ensuring all changes are fully defined, evaluated, and systematically controlled. Tasks and notifications are routed to responsible stakeholders through repeatable workflows, promoting departmental accountability and coordination. Operationally, this stage significantly enhances change discipline; designs cannot be altered without proper review, which reduces costly errors and ensures that downstream functions (like manufacturing and quality) always operate with the correct, approved product data. Overall, Product Change Management introduces a higher level of rigor to product updates, enabling the traceable evolution of the product definition over time.

Extended – PLM Expansion (1/2)

In the fourth stage, product information management reaches beyond engineering to become an enterprise-wide solution. The PLM platform now manages multiple aspects of the product lifecycle in an integrated manner. A key expansion includes support for various BOM views, such as Engineering BOM, Manufacturing BOM, and Service BOM, all derived from the master data yet tailored to specific needs. The system may also incorporate a Bill of Process (BOP), which captures manufacturing process plans alongside product structures. Variability and Configuration Management capabilities enable the definition of product variants and options within a unified product model, allowing different configurations to be managed without duplicating data. Furthermore, the PLM environment expands to include Requirements Management, linking high-level requirements to designs and test cases, and Asset Management, which tracks products in the field, including as-maintained BOMs and service records. At this stage, the PLM system effectively functions as the product information backbone of the company, managing various product structures and lifecycle data in one centralized location.

Extended – PLM Expansion (2/2)

Equally important at this stage is the seamless integration with other enterprise systems and tools. Advanced PLM supports richer connectivity with CAD and other CAX (computer-aided technologies) across mechanical, electrical, and software domains, enabling a single platform to manage design data from multiple disciplines. It also interfaces with Computer-Aided Manufacturing (CAM) tools and Manufacturing Execution Systems (MES), allowing engineering data to flow into production planning. The architecture of the PLM system is typically open and configurable, featuring well-defined APIs or connectors that facilitate integration. This openness ensures that the PLM can flexibly connect to ERP, MES, or other business systems and can be extended or customized as the company's needs grow. Configurable interfaces enable even complex integrations, such as synchronizing CAD structures or processing data with external systems, to share information seamlessly. The operational impact of this stage is significant: it breaks down data silos between departments. Engineering, manufacturing, quality, and service teams work from the same digital thread of product information. This improves collaboration and efficiency as changes or updates propagate through all related data (designs, BOMs, process plans), ensuring everyone sees a consistent, up-to-date picture. Moreover, the company gains agility for future growth since the PLM backbone can readily integrate new tools or adapt to new processes without starting from scratch.

Optimized – Beyond PLM Through Advanced Product Wellbeing (1/3)

The fifth stage represents the pinnacle of product information architecture maturity. At this stage, the PLM system emphasizes a holistic approach to the wellbeing of product data and its lifecycle, focusing on complete traceability, sustainability, and enterprise-wide alignment based on the PPDT (People, Process, Data, and Technology) model. All product information and changes are fully traceable from conception through development, production, and field use, providing end-to-end visibility into the product's history and performance. The PLM supports internal operations and connects the extended enterprise, functioning as a digital backbone that links ERP, MES, supply chain partners, and customer-facing systems. Changes initiated in one area (for example, a supplier updating an item specification or a field service identifying an issue) flow through a unified change process across the company and its partners. This tight integration between PLM and other systems creates a seamless digital thread, or data continuity, throughout the product's life, enabling organizations to achieve full traceability of product changes and ensure compliance with regulatory and quality standards across all domains.

Optimized – Beyond PLM Through Advanced Product Wellbeing (2/3)

The PLM environment is further enhanced at this maturity level with an AI agent-based continuous assistant that proactively supports users. This intelligent agent anticipates user needs, retrieves and prepares relevant data automatically, and provides step-by-step guidance to ensure all principles and rules are followed. It suggests possible solutions to problems as they arise, helping users make informed decisions faster. Eventually, the agent automates verification and validation activities and communicates seamlessly with all relevant stakeholders, ensuring transparency, traceability, and actionability across the extended enterprise.

One of the key aspects of this stage is sustainability management, along with a broader view of a product's impact throughout its entire lifecycle. The advanced PLM framework can directly integrate environmental compliance data, lifecycle assessments, and sustainability metrics into product records. By using the digital thread that now connects design, manufacturing, and usage data, companies can gather insights to inform greener design choices and monitor sustainability goals. A robust PLM foundation with an enterprise digital thread helps inform and validate sustainability initiatives, transforming vast amounts of product data into actionable environmental insights.

Optimized – Beyond PLM Through Advanced Product Wellbeing (3/3)

Furthermore, enterprise-wide change processes are unified: there is little distinction between "product change" and "manufacturing change." All modifications are part of one cohesive workflow accessible to all stakeholders, from R&D to supply chain to service teams. Customer-driven changes are also integrated via CPQ (Configure-Price-Quote) and other sales configuration tools linked to PLM, allowing custom orders or configurations to flow directly into the product data model. Overall, at the Product Wellbeing Management stage, the organization achieves a state of digital continuity in which all product-related information across business units and throughout the value chain is interconnected. This results in superior agility and responsiveness: any change, requirement, or improvement can be traced, assessed for impact, and executed with a comprehensive understanding of its effects both downstream and upstream. This stage delivers a sustainable, transparent, and fully integrated product lifecycle environment, ensuring that the product's wellbeing is maintained through every business transition and throughout its life.