



**PLM**

# Product Lifecycle Management

*“Providing an authoritative source of product data throughout the lifecycle of a weapon system along with the disciplined process for managing changes”*

## **FACT SHEET**

### ***What is PLM?***

Product Lifecycle Management (PLM) is the process of managing the configuration of a product through a structured disciplined approach that ensures operational safety, suitability, and effectiveness (OSS&E) is maintained throughout the entire lifecycle of the product. It includes capability/need assessment, requirement generation, concept definition, systems engineering, product design and development, testing, production, fielding, operations and sustainment, and decommissioning/disposal. PLM includes Product Data Management (PDM) and critical business processes throughout the product lifecycle. It uses a closed-loop Change Management process to manage product configuration and product data for entire product lifecycle. Examples of data managed by PLM include product requirements, performance models, engineering drawings and/or Computer Aided Design (CAD) generated models, Technical Orders (TO), Bills of Material (BOM), design or performance deficiencies, operational and maintenance information, process specifications, lessons learned, etc.

Several Commercial-off-the-Shelf (COTS) vendors have developed tools/systems for managing product lifecycle. These systems provide a collaborative and secure environment to generate, describe, manage and communicate information about products. The systems also provide a robust infrastructure for program management and configuration management, as well as workflows. The workflows enable a structured and disciplined approach for business processes to manage products effectively and efficiently. Typically a PLM system is integrated with other enterprise applications such as Enterprise Resource Planning (ERP), Supply Chain Management (SCM), and Customer Relations Management (CRM).

### ***What is the importance of PLM?***

The Air Force Logistics Enterprise Architecture (LogEA) Concept of Operations (CONOPS) describes a future state that effectively supports the warfighter by rapidly reacting to changes in the Air Expeditionary Force (AEF) battle rhythm. It identifies PLM as the principal source of information to create a centralized production plan, manage inventory, and create a supply chain plan. LogEA calls for the management of data and processes, which span the entire lifecycle. The LogEA CONOPS emphasizes the need to maintain OSS&E for all weapon systems while evolving our current reactive sustainment environment into a predictive sustainment environment.

In 2004, an Air Force bill of material (BOM) pilot study was conducted to identify the gaps in the current BOM process, to define the future process based on commercial best practices, and to enable the new process with a COTS software package. The pilot project identified two major weaknesses. The first weakness is a lack of data accuracy and integrity because the downstream users of product data are independent of the engineering database. The second weakness is lack of a comprehensive configuration management process to link engineering with repair, local manufacturers, inventory management, and forecasting processes. The study demonstrated a feasibility of using COTS PLM tools to implement a streamlined closed-loop change process. The study concluded that PLM will ensure that Air Force weapon systems are properly configured and downstream processes meet operational safety, suitability, and effectiveness requirements.

### ***What are the four major components?***

#### ***Lifecycle Data Management and Collaboration***

Lifecycle Data Management and Collaboration is the ability to define life cycle states and

attributes for a product and collaboratively manage transitions through the product lifecycle. Lifecycle Data Management begins at the earliest point of customer requirements and product concept, and extends until the product is obsolete and field support has ceased. It includes the complete product, from mechanical and electronic components, to software and documentation. It includes the entire set of information that defines how the product is designed, manufactured, and serviced. And it resides not just within an individual organization, but across the entire enterprise, including the acquisition, supply chain, vendors, and suppliers.

### **Change Management**

Change Management is the disciplined process for proposal, evaluation, approval/ disapproval, and documentation of proposed changes to the product configuration. Change Management typically involves change objects such as Change Proposals, Change Investigations, etc. It allows for the ability to link all types of product data objects to the change proposals. Change Management can help define and control changes to product configurations, part definitions, data relationships, versions, and variants. The system records information at each step of a process. As such, users and managers can review the complete change history at any time.

### **Configuration Management**

Configuration Management is the set of technical data and documentation that uniquely identifies and completely describes a particular product configuration (down to serial number level) at any point during the product lifecycle. PDM systems facilitate the creation and management of product configurations and the BOMs. As configurations change over time, PDM systems can track versions, efficacy, and design variations. PDM systems allow users and applications to link product definition data such as drawings, documents, process plans to parts and assemblies within a product structure. This facilitates the determination of the information that will be affected by a change.

### **Workflow**

Workflow is defined as a sequence of tasks and events. Workflow provides review and approval routing via an automated email. Process tracking enables users to indicate the status of requirements, deliverables, and activities. Self-subscription alerts allow users to track and/or be alerted to new activities/deliverables that they are responsible for completing. Workflow can automatically route electronic folders or “packages” of information or work packages to reviewers either serially, in parallel, or a combination of both. Workflow can be used to monitor processes ensuring that one process finishes before another starts. It also can provide management reporting.

### **What is the PLM timeline?**

The initial PLM Pathfinder initiative began with the F101 engine at OC-ALC in December 2005 where data model characteristics were identified and the engineering services workflow was developed. As of August 2006, the PLM application was loaded on the Test Development Range (TDR) at Gunter AFB for testing in the GCSS-AF environment. By mid-October the complete F-101 engine BOM will be loaded and the workflow configured. User training, testing, and evaluation will be conducted in the TDR environment during mid-October 2006. By 1 November 2006, PLM will be operational on the GCSS-AF framework for the F-101 engine maintaining the engineering BOM. Once the ECSS Oracle e-business suite is established, a consolidated PLM, Advanced Planning and Scheduling (APS), and Maintenance Repair and Overhaul pathfinder will be established to develop the integrated environment. In this environment, the repair, manufacturing, and planning BOMs will be derived from the engineering BOM maintained in the PLM application and a workflow will manage all of the changes to the engineering BOM.

### **How can I learn more about the PLM?**

For more information, we invite you to visit our website at: <https://www.my.af.mil>

Air Force > Transformation > eLog21

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