



Certified in Planning and Inventory Management

Product Life Cycle
Management



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Product Life Cycle Management

1. Fundamentals of Product Life Cycle Management

PLM is the structured approach to managing a product from its conception through design, development, production, distribution, service, and eventual disposal. It integrates people, processes, and technology to ensure product data is captured, shared, and maintained throughout the lifecycle. CPIM emphasizes PLM as a strategic enabler that links engineering, operations, supply chain, and marketing. Effective PLM improves product quality, reduces time-to-market, enhances cross-functional collaboration, and maintains accurate data for planning systems such as MRP and ERP. Understanding the fundamentals establishes a strong foundation for analyzing the downstream impacts on inventory, sourcing, and production planning.

2. Product Life Cycle Stages

Products typically progress through four stages: introduction, growth, maturity, and decline. Each phase requires distinct planning, forecasting, and inventory strategies. For example, introduction relies on uncertain demand and requires flexible supply planning, while maturity focuses on efficiency and cost control. Decline requires inventory reduction and strategic discontinuation planning. Understanding lifecycle transitions allows planners to anticipate market shifts, adjust inventory buffers, and optimize supply chain performance. Lifecycle awareness also helps avoid overproduction, obsolete inventory, and service-level issues.

3. New Product Development (NPD) and Introduction

NPD is the process of designing, testing, and launching new products. PLM supports NPD by providing structured workflows, version control, and collaboration tools. During introduction, planners must manage high uncertainty and may depend on pilot builds, limited production runs, and close coordination between engineering and operations. Demand forecasting relies heavily on market insight rather than historical data. Understanding NPD processes helps supply chain planners prepare accurate BOMs, update master data, and design flexible manufacturing strategies to support successful launches.

4. Engineering Change Management (ECM)

Engineering changes—such as part revisions, material substitutions, or process updates—must be systematically controlled to avoid disruptions. ECM ensures that changes are documented, approved, and implemented correctly across BOMs, routings, inventory, and planning systems. Poor ECM can result in mixed parts, production delays, scrap, or customer dissatisfaction. PLM tools help manage change versions, effective dates, and impacted components. Understanding ECM is essential for ensuring synchronized planning signals and preventing inaccurate MRP outputs.

5. Managing Bill of Materials (BOM) Throughout the Lifecycle

BOMs evolve as products mature. Early stages may involve prototype BOMs, engineering BOMs (EBOMs), or manufacturing BOMs (MBOMs). Planners must track version changes, substitute materials, and ensure accurate BOM

structures for MRP. Lifecycle management ensures BOM accuracy across engineering, purchasing, and production. Errors in BOMs lead to incorrect planning, procurement mismatches, and production delays. PLM systems help maintain BOM integrity across the full product lifecycle.

6. Phase-In and Phase-Out Planning

Phase-in refers to introducing new products or components; phase-out refers to retiring old versions. Planning must ensure that obsolete inventory is minimized and new items are integrated smoothly. Effective phase-in/out reduces material waste, prevents service disruptions, and maintains customer satisfaction. Planners use last-time-buy (LTB) decisions, run-out schedules, and cross-functional communication to manage transitions. Understanding these processes is critical to preventing shortages or excess inventory.

7. Obsolescence Management

Obsolescence occurs when products or components are no longer supported due to technology changes, regulatory updates, or market shifts. Planners must identify potential obsolescence early and take preventative actions such as supplier collaboration, inventory reduction, and forecasting end-of-life demand. Obsolescence can represent significant financial risk if not managed carefully. PLM systems help signal upcoming changes and track item versions to reduce scrap and write-offs.

8. Product Portfolio Management (PPM)

PPM ensures that an organization maintains a balanced mix of products that align with strategic goals. It considers

profitability, market trends, resource allocation, and lifecycle stage. PPM decisions impact production scheduling, capacity planning, and inventory strategy. Effective portfolio management prevents internal competition for resources and removes underperforming products in a timely fashion. Understanding PPM helps planners align operational decisions with corporate strategy.

9. Master Data Management in PLM

Master data—such as item numbers, BOMs, routings, lead times, and costing—must remain accurate across the lifecycle. Poor master data causes inaccurate MRP signals, production errors, procurement delays, and financial discrepancies. PLM helps maintain version-controlled, traceable master data that integrates with ERP systems. Understanding master data management ensures that planners maintain integrity in production and purchasing plans.

10. Sustainability and End-of-Life Disposal

Products eventually reach end-of-life, requiring disposal, recycling, or repurposing strategies. Sustainability principles help organizations reduce environmental impact while complying with regulations. Planners must consider waste management, hazardous materials handling, and reverse logistics. Lifecycle thinking supports the design of environmentally friendly products and minimizes long-term disposal costs.

11. Cross-Functional Collaboration in PLM

PLM requires coordination among engineering, operations, procurement, marketing, and logistics. Each function

contributes vital input to product design, forecasting, inventory planning, and lifecycle transitions. Effective collaboration reduces errors, accelerates time-to-market, and ensures consistent planning data. Planners must communicate regularly to align MPS, purchasing, and capacity plans with product life cycle changes.

12. Regulatory and Compliance Requirements

Many products must meet legal, industry, or safety regulations throughout their lifecycle. Examples include FDA rules for medical devices, RoHS for electronics, and ISO standards for manufacturing. PLM systems track compliance documents, audit trails, and quality records. Understanding compliance requirements prevents product recalls, fines, and production halts. Planners must integrate compliance into sourcing, inventory, and production decisions.

13. Configuration Management

Configuration management ensures that the correct product design, specifications, and documentation are used throughout the lifecycle. It helps manage variants, options, and product families. This is especially important for customizable products. Configurations must be tracked to avoid manufacturing errors and customer dissatisfaction. PLM tools provide revision control and help maintain consistency. Planners must interpret configurations accurately to ensure MRP generates correct dependent requirements.

14. Demand Forecasting by Lifecycle Stage

Each lifecycle stage requires different forecasting techniques. Introduction relies on qualitative inputs; growth

uses trend-based models; maturity uses historical data; decline uses terminal and replacement demand models. Understanding forecasting by lifecycle ensures accurate MPS development, inventory planning, and supply management. Planners must monitor lifecycle transitions to update forecasting assumptions.

15. Impact of Product Lifecycle on Inventory Strategy

Inventory levels must adapt to lifecycle changes. Early stages require cautious inventory due to uncertainty; growth involves safety stock increases; maturity focuses on efficiency; decline requires reduction strategies. Lifecycle-driven inventory planning prevents write-offs, shortages, and excess stock. Planners must use techniques like target levels, buffers, and risk-based safety stock.

16. Supplier Collaboration in Lifecycle Planning

Suppliers play a crucial role in NPD, engineering changes, and end-of-life management. Early supplier involvement improves manufacturability and reduces cost. During phase-out, suppliers help plan last-time buys and identify alternatives. Effective collaboration improves reliability, reduces supply risk, and supports lifecycle transitions. Planners must maintain strong communication with suppliers to manage lifecycle impacts.

17. Cost Management Across the Lifecycle

Lifecycle costing includes development cost, production cost, maintenance cost, and disposal cost. Understanding cost drivers helps planners optimize sourcing, capacity, and production decisions. Mature products require cost-efficiency strategies, while new products may warrant

investment in flexibility. Lifecycle cost analysis supports rational portfolio decisions and profitability improvements.

18. Technology Integration in PLM Systems

Modern PLM uses digital tools—CAD, ERP, MRP, PDM, and cloud platforms—to manage product information.

Understanding how PLM integrates with ERP ensures seamless data flow for planning. Digital PLM enhances collaboration, traceability, and revision control. Planners must understand system interactions to prevent data inconsistencies and ensure reliable planning signals.

19. Quality Management Throughout the Lifecycle

Quality must be ensured from design and prototype stages through production and service. PLM supports quality management through document control, root cause analysis, and corrective actions. Good quality practices reduce scrap, rework, warranty costs, and customer complaints. Planners must incorporate quality feedback into forecasting, sourcing, and production planning.

20. Continuous Improvement in Lifecycle Management

PLM is not static; it benefits from continuous improvement through lean tools, Kaizen, feedback loops, and data analytics. Lessons learned from past products guide better future designs, cost reductions, and improved manufacturability. Continuous improvement enhances planning accuracy, reduces lifecycle costs, and speeds up product transitions. Planners must incorporate performance metrics into lifecycle decision-making.

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6. Warehouse Layout and Operations Efficiency
7. Supply Chain Risk Management
8. Supply Chain Performance Metrics (KPIs)
9. Lean Supply Chain Practices
10. Agile and Responsive Supply Chains
11. Sales and Operations Planning (S&OP)
12. Supply Chain Network Design
13. Supply Chain Digital Transformation
14. AI and Data Analytics in Supply Chain
15. Supply Chain Sustainability and Green Logistics
16. Reverse Logistics and Returns Management
17. Supply Chain Collaboration and Integration
18. Supplier Relationship Management in SCM
19. Global Supply Chain Strategy
20. Transportation Management Systems (TMS)
21. Inventory Optimization Models
22. Demand-Driven MRP (DDMRP) Concepts
23. Blockchain Applications in Supply Chain
24. Supply Chain Cost Reduction Techniques
25. SCOR Model and Process Improvement

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27. Managing Supply Chain Disruptions
28. End-to-End Supply Chain Visibility
29. Cold Chain Logistics Management
30. Supply Chain Compliance and Ethics
31. Import–Export Procedures and Documentation
32. Managing Third-Party Logistics (3PL) Providers
33. Supply Chain Collaboration Technologies
34. Production Planning and Scheduling
35. Strategic Supply Chain Design Using Case Studies
36. Circular Economy in Supply Chain
37. Vendor-Managed Inventory (VMI)
38. Transportation Optimization Techniques
39. E-Commerce Supply Chain Models
40. Omni-Channel Fulfillment Strategies
41. Warehouse Automation and Robotics
42. SCOR DS Roadmap for Supply Chain Excellence
43. Customer-Centric Supply Chain Strategies
44. Supply Chain Finance and Working Capital Management
45. Supply Chain Data Visualization Using Power BI
46. Strategic Sourcing in Supply Chain Context
47. Supply Chain Benchmarking and Best Practices
48. Integrated Business Planning (IBP)
49. Supply Chain in Crisis Management and Recovery
50. Future Trends and Technologies in Supply Chain

Micro-Learning Programs in Procurement



1. Fundamentals of Procurement Management
2. Strategic Sourcing and Category Management
3. Supplier Selection and Evaluation
4. Contract Management Essentials
5. Cost and Price Analysis in Procurement
6. Negotiation Strategies for Procurement Professionals
7. E-Procurement and Digital Tools
8. Procurement Planning and Budgeting
9. Risk Management in Procurement
10. Supplier Relationship and Performance Management
11. Sustainable and Ethical Procurement
12. Total Cost of Ownership (TCO) Analysis
13. Make-or-Buy Decision Frameworks
14. Procurement Policies and Governance
15. Procurement in Public vs. Private Sectors
16. Procurement Audit and Compliance
17. Procurement Data Analytics and Reporting
18. Procurement Scorecards and KPIs
19. Strategic Supplier Partnerships
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22. Negotiation Simulation Workshop
23. Contract Law for Procurement Managers
24. Cost Reduction Strategies in Procurement
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Micro-Learning Programs in Procurement ...



26. Procurement Process Mapping and Improvement
27. Procurement Automation and AI Applications
28. Managing Procurement Teams Effectively
29. Procurement Ethics and Transparency
30. Procurement in the Digital Supply Chain
31. Vendor Consolidation Strategies
32. Spend Analysis and Optimization
33. Demand Forecasting for Procurement
34. E-Auction and Reverse Bidding Techniques
35. Inventory and Procurement Alignment
36. Procurement in Project-Based Organizations
37. Supplier Onboarding and Development
38. Procurement Market Intelligence
39. Measuring Supplier Innovation
40. Procurement in Times of Supply Disruption
41. Cross-Functional Collaboration in Procurement
42. Writing Effective RFPs, RFQs, and RFIs
43. Contract Negotiation Best Practices
44. Green Procurement and Circular Economy
45. Legal Aspects of Procurement Contracts
46. Performance-Based Contracting
47. Procurement Leadership and Strategic Influence
48. Cost Avoidance and Value Creation in Procurement
49. Managing Procurement with Power BI Dashboards
50. Future Skills and Trends in Procurement



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