Certified in Planning and Inventory Management

Inventory Traceability

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Inventory Traceability

1. End-to-End Traceability

End-to-end traceability refers to the ability to track inventory from the point of origin (raw materials) to the final customer. It ensures visibility across procurement, production, warehousing, distribution, and returns. The purpose is to identify the precise movement, status, and transformation of inventory throughout the supply chain. High-end traceability enables companies to quickly locate defects, verify compliance, ensure product authenticity, and respond efficiently to recalls. CPIM candidates must understand how technologies, processes, and documentation integrate to achieve full supply chain transparency.

2. Lot and Batch Control

Lot or batch control involves grouping products produced under similar conditions and assigning them unique identifiers. This allows organizations to trace items back to specific production runs for quality assurance and regulatory compliance. Lot control is vital in industries such as food, pharmaceuticals, and chemicals where contamination or defects must be isolated quickly. Understanding batch genealogy, batch splitting, and batch merging is essential. CPIM focuses on how lot control supports accurate record-keeping, recall management, and FIFO/FEFO inventory rotation strategies.

3. Serial Number Tracking

Serial tracking assigns a unique identifier to each individual item rather than to a group or batch. This provides the

highest level of granularity and traceability, allowing companies to track specific units throughout the entire supply chain. It is common in electronics, medical devices, and high-value goods. Serial tracking supports warranty validation, theft reduction, lifecycle tracking, and after-sales service. CPIM testing emphasizes understanding how serial data flows through ERP, WMS, and MES systems and how it enhances inventory accuracy and accountability.

4. Genealogy Tracking

Product genealogy captures the complete history of an item — including raw materials, intermediate components, process steps, equipment used, and operators involved. It allows supply chain professionals to trace any finished product back to every input and transformation it underwent. Genealogy systems are essential in regulated industries to prove compliance, ensure product integrity, and manage recalls efficiently. CPIM candidates must understand component-to-assembly relationships, parent-child records, and how genealogy supports root-cause analysis in manufacturing quality issues.

5. Traceability Regulations and Compliance

Regulatory requirements drive many traceability practices. Industries such as pharmaceuticals (DSCSA), food (FSMA), medical devices (UDI), and automotive (ISO/TS standards) require accurate tracking and documentation. Compliance ensures customer safety, legal adherence, and quality assurance. CPIM highlights the importance of implementing processes that meet regulatory mandates, maintaining proper audit trails, and understanding the consequences of non-compliance. Knowledge of labeling, documentation,

and electronic records management is crucial.

6. Barcode and RFID Technologies

Barcodes and RFID are foundational technologies used for inventory identification and traceability. Barcodes require line-of-sight scanning and are cost-effective, while RFID enables wireless, bulk, and non-line-of-sight scanning. Both technologies reduce manual entry errors, improve speed, and support real-time visibility. CPIM emphasizes selecting the right technology based on cost, environment, item characteristics, and operational needs. Understanding encoding, scanning processes, and integration with ERP/WMS systems is vital.

7. ERP, WMS, and MES Integration

Inventory traceability depends on seamless data flow across ERP (planning), WMS (warehouse management), and MES (manufacturing execution). These systems collectively ensure accurate tracking of materials, work-in-process, and finished goods. Integration eliminates data gaps, prevents duplication, and enhances real-time visibility. CPIM focuses on how transactions such as receipts, issues, completions, movements, and shipments must be properly recorded across systems to maintain traceability integrity.

8. Real-Time Inventory Visibility

Real-time visibility provides up-to-date information on inventory location, status, quantity, and movement. It is achieved through automated data capture, integrated systems, and IoT devices. Real-time data supports better planning, faster recall response, reduced shrinkage, and improved service levels. CPIM stresses how real-time

visibility enhances decision-making, supports lean processes, and minimizes discrepancies between physical and system inventory.

9. Data Capture Accuracy

Accurate data capture is fundamental to reliable traceability. Errors in scanning, labeling, or transaction entry create visibility gaps and undermine compliance. CPIM emphasizes process standardization, operator training, error-proofing (poka-yoke), validation rules, and automation to ensure high-quality data. Understanding root causes of inventory inaccuracies and mitigation strategies is essential for maintaining traceability integrity.

10. Inventory Movement Controls

Movement controls define how inventory transitions from one location to another — receipts, transfers, issues, put-aways, and picking operations. Each movement must be uniquely recorded and tied to traceability identifiers like lot numbers or serial numbers. CPIM stresses documenting every movement to ensure accurate location control and support FIFO/FEFO rules. These controls prevent loss, misplacement, and unauthorized movement of materials.

11. Recall and Reverse Traceability

Reverse traceability enables companies to trace defective or contaminated products backward from customers to origin. This is critical for recall management. Companies must quickly identify affected lots, batches, components, and distribution routes. CPIM highlights the importance of reconstructing product histories, maintaining audit-ready

traceability records, and having predefined recall procedures. Efficient reverse traceability minimizes financial losses and maintains brand reputation.

12. Forward Traceability

Forward traceability tracks items from suppliers through production and distribution to customers. It ensures visibility of where each product or component has been used or shipped. Forward tracing is essential for proactive quality management and identifying customers affected by production issues. CPIM emphasizes linking supplier data, production orders, packaging, and shipping documentation to maintain continuity of product identification.

13. Chain-of-Custody Documentation

Chain-of-custody records show who handled the product at each point in the supply chain. It ensures accountability and prevents tampering, fraud, and contamination. Documentation includes timestamps, handlers, locations, conditions (e.g., cold chain), and lot/serial identifiers. CPIM stresses the importance of secure documentation to maintain compliance with regulatory and industry standards.

14. Cold Chain Traceability

Cold chain traceability ensures that perishable or temperature-sensitive products are tracked under controlled conditions throughout storage and transportation. Sensors, data loggers, and RFID support real-time temperature monitoring. CPIM emphasizes understanding how breaks in the cold chain impact product integrity, customer safety, and regulatory compliance.

Traceability systems must record temperature history, handling, and transit details.

15. Supplier Traceability and Visibility

Supplier traceability involves tracking materials back to their original suppliers and ensuring that suppliers provide accurate identification and documentation. It supports quality control, risk mitigation, and compliance. CPIM underscores the importance of supplier audits, vendor rating systems, certification processes, and documentation requirements to maintain strong traceability links upstream.

16. Work-in-Process (WIP) Traceability

WIP traceability tracks materials as they move through various stages of production. It ensures visibility of components, subassemblies, operator actions, and equipment used. This supports production control, quality assurance, and capacity planning. CPIM highlights the need for accurate routing records, operation reporting, and automated tracking methods like MES systems to achieve WIP visibility.

17. Labeling Standards and Identification Systems

Proper labeling ensures consistent product identification across the supply chain. Standards like GS1 define formats for barcodes, serialized identifiers, and data structures. CPIM emphasizes the importance of standardized labeling to ensure interoperability, reduce errors, and support global traceability. Labels must be readable, durable, and compliant with industry requirements.

18. Documentation and Record Retention

Traceability requires maintaining accurate and accessible records, including production logs, test results, supplier data, and shipment documentation. CPIM emphasizes compliance with retention policies, regulatory demands, and audit requirements. Records must be protected from loss, corruption, and unauthorized access. Digital systems improve retrieval speed and accuracy.

19. Blockchain in Traceability

Blockchain provides a tamper-proof, decentralized ledger for recording product movements and ownership changes. It enhances trust, transparency, and authenticity across supply chains. CPIM recognizes blockchain as an emerging technology that improves anti-counterfeit measures, recall accuracy, and regulatory compliance. While adoption varies, understanding its potential benefits and limitations is important for modern supply chain professionals.

20. Traceability KPIs and Performance Metrics

Key performance indicators measure how effectively traceability systems operate. Common KPIs include traceability response time, recall completion time, data accuracy rates, scanning compliance, and visibility coverage. CPIM stresses the role of KPIs in continuous improvement, risk reduction, and regulatory readiness. Metrics help identify process gaps and drive investment in better technologies.

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7. Supply Chain Risk Management
8. Supply Chain Performance Metrics (KPIs)
9. Lean Supply Chain Practices
10. Agile and Responsive Supply Chains
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15. Supply Chain Sustainability and Green Logistics
16. Reverse Logistics and Returns Management
17. Supply Chain Collaboration and Integration
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19. Global Supply Chain Strategy
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22. Demand-Driven MRP (DDMRP) Concepts
23. Blockchain Applications in Supply Chain
24. Supply Chain Cost Reduction Techniques
25. SCOR Model and Process Improvement

Micro-Learning Programs in Supply Chain Management …

26. Capacity Planning and Resource Allocation
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)
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39. E-Commerce Supply Chain Models
40. Omni-Channel Fulfillment Strategies
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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
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50. Future Trends and Technologies in Supply Chain

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17. Procurement Data Analytics and Reporting
18. Procurement Scorecards and KPIs
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Micro-Learning Programs in Procurement …

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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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