Certified in Planning and Inventory Management

Distribution and Inventory Planning

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Distribution and Inventory Planning

1. Distribution Requirements Planning (DRP)

Distribution Requirements Planning (DRP) is a time-phased replenishment planning technique that determines when and how much inventory should be moved across the distribution network. DRP integrates demand forecasts, inventory balances, lead times, lot sizes, and safety stock to generate planned orders. It mirrors MRP logic but applies it to finished goods within the distribution system. DRP improves customer service, reduces stockouts, and optimizes transportation costs by ensuring the right products are available at the right locations. Understanding DRP logic, buckets, and system outputs is fundamental for CPIM.

2. Time-Phased Planning

Time-phased planning structures demand, supply, and inventory decisions into discrete time buckets such as days, weeks, or months. It helps planners visualize projected inventory positions, replenishment needs, and shortages over time. In distribution planning, time-phasing is essential to understand how different stocking locations must be replenished based on forecasted requirements and lead times. CPIM emphasizes how time-phased records, including planned orders, scheduled receipts, and net requirements, drive visibility and proactive decision-making in supply chains.

3. Distribution Network Design

Distribution network design involves configuring the optimal number, size, and location of warehouses,

distribution centers, cross-docks, and customer zones. It aims to balance cost and service trade-offs, considering transportation costs, facility costs, service-level expectations, and strategic objectives. A well-designed network minimizes lead times, reduces logistics costs, and improves responsiveness. CPIM candidates must understand network modeling, centralization vs. decentralization, and the impact of design decisions on inventory levels and distribution efficiency.

4. Replenishment Methods

Replenishment methods determine how and when inventory is refilled. Common approaches include min-max systems, periodic review, continuous review, and demand-driven replenishment. In distribution environments, selecting the right method ensures stock availability while controlling carrying costs. CPIM highlights how replenishment methods must align with demand patterns, order cycles, service requirements, and supply variability. Understanding reorder points, order quantities, and reorder triggers is crucial for effective distribution planning.

5. Safety Stock Management

Safety stock protects against uncertainty in demand and supply. Managing safety stock in a distribution network requires balancing variability across multiple stocking locations, considering lead-time fluctuations, demand variability, and service-level goals. CPIM emphasizes safety stock formulas, statistical approaches, and the role of ABC classification. Proper safety stock management prevents stockouts while minimizing excess inventory, enabling stable service performance.

6. Forecasting for Distribution

Effective distribution planning depends on accurate demand forecasts at the SKU-location level. Forecasting approaches must incorporate seasonality, historical sales patterns, promotions, and market intelligence. CPIM focuses on the importance of forecast accuracy, forecast error measurement (MAPE, MAD), and forecast collaboration with sales and marketing. Good forecasting helps avoid the bullwhip effect, lowers safety stock needs, and improves replenishment efficiency.

7. Inventory Positioning and Deployment

Inventory positioning involves deciding where to hold stock in the network to balance cost and service objectives. Deployment strategies determine how inventory is allocated and moved. Key approaches include push, pull, and hybrid systems. Centralized vs. decentralized stocking decisions significantly affect responsiveness, risk pooling, and carrying costs. CPIM covers how inventory must be strategically deployed to ensure service-level targets are met with optimal investment.

8. Multi-Echelon Inventory Optimization

Multi-echelon inventory optimization considers the entire distribution network—plants, central warehouses, regional warehouses, and retailers—to set optimal inventory levels. It recognizes that decisions at one echelon affect others. Techniques such as risk pooling and service-level coordination help reduce network-wide inventory while maintaining high service levels. CPIM teaches how multi-echelon models differ from single-location calculations and why they are essential for modern supply chains.

9. Transportation Planning and Integration
Transportation planning ensures timely and cost-effective movement of goods across the distribution network. It involves mode selection, carrier management, routing, and load consolidation. Transportation decisions directly affect lead times, replenishment frequency, safety stock levels, and total logistics cost. CPIM emphasizes integrating transportation data into DRP, using shipment frequency rules, and understanding how transportation variability impacts inventory planning.

10. Lead Time Management
Lead times in distribution consist of order processing, picking, packing, shipping, and transit time. Long or variable lead times increase uncertainty and drive up safety stocks. CPIM highlights the importance of measuring lead-time variability, negotiating with carriers, optimizing warehouse processing, and reducing bottlenecks. Planners must understand how lead times influence DRP plans and how to use lead-time offsets in time-phased records.

11. Service Level Planning
Service level planning defines how reliably a company meets customer demand. It includes cycle service level, fill rate, and order completeness targets. Higher service levels require more inventory and cost, while lower service levels risk customer dissatisfaction. CPIM emphasizes analyzing service-level trade-offs, segmenting customers, and aligning service strategies with inventory policies. Setting proper service levels ensures cost-effective customer satisfaction throughout the distribution network.

12. Order Fulfillment Strategies

Order fulfillment strategies determine how customer orders are processed and filled. Approaches such as make-to-stock, make-to-order, assemble-to-order, and configure-to-order influence inventory planning and distribution responsiveness. CPIM stresses how fulfillment strategies affect stocking decisions, lead times, and replenishment logic. Efficient fulfillment requires coordination between manufacturing, warehousing, transportation, and customer service.

13. Inventory Balancing and Redistribution

Inventory balancing involves shifting stock between locations to correct imbalances caused by forecast errors, demand surges, or replenishment delays. Techniques include lateral transfers, reallocation, and returns-to-stock processes. Inventory balancing helps prevent stockouts in some locations while reducing excess in others. CPIM emphasizes evaluating cost trade-offs, transportation impacts, and system controls for redistribution.

14. The Bullwhip Effect

The bullwhip effect occurs when small changes in customer demand generate increasingly larger fluctuations upstream in the supply chain. Causes include poor forecasting, long lead times, order batching, price fluctuations, and lack of visibility. CPIM stresses how the bullwhip effect leads to excess inventory, stockouts, and inefficiencies. Distribution planning helps mitigate bullwhip impacts through better forecasting, information sharing, and consistent replenishment policies.

15. Inventory Carrying Cost Management
Carrying costs include capital cost, storage, obsolescence, shrinkage, and insurance. In distribution networks, carrying cost increases with the number of locations and inventory levels. CPIM focuses on understanding how inventory decisions influence total logistics cost and how tools like ABC analysis and inventory optimization help reduce carrying costs. Proper cost analysis supports optimal replenishment and stocking strategies.

16. Centralized vs. Decentralized Distribution
Centralized distribution consolidates inventory into fewer locations, reducing safety stock through risk pooling but often increasing delivery times. Decentralized distribution places inventory closer to customers, improving responsiveness but increasing carrying costs. CPIM highlights evaluating trade-offs between cost, speed, service, and network complexity. Understanding the impact on replenishment frequency, forecasting, and transportation is essential.

17. Warehouse Management and Slotting
Warehouse management involves coordinating receiving, put-away, picking, packing, and shipping. Effective slotting places high-demand and high-turn items in optimal locations to reduce handling time. CPIM emphasizes how warehouse efficiency directly supports distribution planning by affecting replenishment lead times, order fulfillment speed, and inventory accuracy. Good WMS integration improves traceability and reduces operational waste.

18. Inventory Visibility Across the Network
Visibility enables real-time tracking of inventory at multiple locations. Technologies such as WMS, ERP, RFID, and IoT help monitor stock levels, movements, and conditions. CPIM stresses how visibility reduces uncertainty, improves service levels, supports better forecasting, and enhances DRP accuracy. Full visibility helps companies respond quickly to demand changes, stockouts, and supply disruptions.

19. Supply and Demand Synchronization
Synchronization aligns supply-side capabilities with demand-side needs across the distribution network. It requires collaboration between sales, marketing, production, and logistics. CPIM highlights processes like S&OP, demand planning, and capacity analysis as core enablers of synchronization. Effective alignment minimizes mismatches, reduces excess inventory, and enhances customer satisfaction.

20. Performance Metrics and Continuous Improvement
Performance metrics evaluate how effectively the distribution network operates. Key indicators include fill rate, perfect order index, inventory turnover, forecast accuracy, order cycle time, and logistics cost. CPIM emphasizes measuring KPIs to identify improvement opportunities and enhance distribution planning maturity. Continuous improvement frameworks like Lean and Six Sigma help reduce waste, improve service, and optimize inventory.

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8. Supply Chain Performance Metrics (KPIs)
9. Lean Supply Chain Practices
10. Agile and Responsive Supply Chains
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12. Supply Chain Network Design
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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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20. Transportation Management Systems (TMS)
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22. Demand-Driven MRP (DDMRP) Concepts
23. Blockchain Applications in Supply Chain
24. Supply Chain Cost Reduction Techniques
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30. Supply Chain Compliance and Ethics
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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
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41. Warehouse Automation and Robotics
42. SCOR DS Roadmap for Supply Chain Excellence
43. Customer-Centric Supply Chain Strategies
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45. Supply Chain Data Visualization Using Power BI
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17. Procurement Data Analytics and Reporting
18. Procurement Scorecards and KPIs
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22. Negotiation Simulation Workshop
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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
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34. E-Auction and Reverse Bidding Techniques
35. Inventory and Procurement Alignment
36. Procurement in Project-Based Organizations
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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
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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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