Certified in Planning and Inventory Management

Production Planning Grid and Production Methods

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Production Planning Grid and Production Methods

1. Production Planning Hierarchy

The production planning hierarchy shows how decisions flow from strategic to operational levels. At the top is the business plan, followed by the production plan, master production schedule (MPS), material requirements planning (MRP), and detailed scheduling. Each level has its own time horizon, data granularity, and decision authority. Understanding how these levels interact ensures consistent and feasible plans. In CPIM, this hierarchy is central to determining how changes at one level cascade downward and how aggregate planning decisions translate into specific production orders across product families and individual SKUs.

2. Purpose of the Production Planning Grid

The production planning grid illustrates relationships among planning levels, time horizons, data detail, and decision-making scope. It visually connects long-term strategic planning with short-term operational activities, helping planners understand which tools, processes, and data are appropriate at each level. The grid also highlights the transition from aggregate to detailed planning. CPIM exams test your knowledge of how the grid ensures planning stability, reduces nervousness in the schedule, and maintains alignment across functions such as sales, operations, finance, and procurement.

3. Aggregate Production Planning

Aggregate production planning (APP) determines the optimal production rate, workforce level, and inventory

position for product families over mid-range horizons. APP balances demand and supply using aggregated data rather than SKU-level detail. You must understand trade-offs among inventory, labor, capacity, and cost. APP informs the production plan and sets the foundation for MPS. CPIM emphasizes APP strategies, inputs, outputs, constraints, and the benefits of working at the family level to simplify planning and reduce complexity.

4. Production Plan Inputs and Outputs

The production plan translates S&OP decisions into feasible capacity and resource commitments. Key inputs include forecasted demand, inventory policies, capacity constraints, backlogs, labor availability, and product families. Outputs include planned production rates, inventory projections, and workforce adjustments. The CPIM exam requires understanding how the production plan feeds into MPS, how it aligns sales and operations objectives, and how it acts as a tactical framework that guides procurement, routing, labor scheduling, and facility utilization.

5. Chase Production Strategy

The chase strategy adjusts production output to match demand as closely as possible. This may involve hiring, layoffs, overtime, or varying shifts. It minimizes inventory but can create instability in workforce morale and capacity usage. Understanding pros and cons, such as flexibility vs. labor cost volatility, is essential. CPIM focuses on when organizations use chase strategies—typically for services or environments where inventory is costly or impossible to store. This strategy is evaluated against others like level and hybrid methods.

6. Level Production Strategy

The level strategy maintains a constant production rate regardless of fluctuations in demand. Organizations build inventory during low-demand periods and draw it down during high-demand periods. The method offers stable labor utilization and predictable resource usage but requires higher inventory investment. CPIM questions emphasize suitability for stable environments, products with low holding costs, and settings where workforce stability is a priority. Comparing level vs. chase strategies is a common exam topic.

7. Hybrid (Mixed) Production Strategy

The hybrid strategy combines elements of both chase and level approaches. It offers flexibility by adjusting some elements (e.g., overtime or subcontracting) while keeping other resources stable. It helps balance labor cost volatility with inventory cost management. CPIM emphasizes identifying when hybrid strategies are appropriate—usually in moderately variable demand environments where neither chase nor level fits perfectly. Understanding how to design hybrid strategies is key for operational flexibility and cost optimization.

8. Capacity Planning and Constraint Management

Capacity planning ensures that aggregate and detailed plans are feasible. It involves analyzing available labor, equipment, suppliers, and logistics capabilities. Constraint management identifies bottlenecks that may limit throughput. Tools like RCCP, resource profiles, and capacity bills are used at different planning levels. CPIM frequently

examines how capacity planning interacts with production methods and how planners address imbalances between required and available capacity through methods like subcontracting, overtime, or equipment investments.

9. Workforce Planning in Production Methods
Workforce planning includes hiring, training, layoffs, cross-training, and scheduling to support production strategies. Chase strategies rely heavily on workforce adjustments, while level strategies minimize them. Cross-training increases flexibility and supports hybrid approaches. Understanding labor cost components, skill availability, labor contracts, and productivity metrics is vital in CPIM. Workforce planning also influences quality, cost, morale, and throughput.

10. Inventory Implications of Production Methods
Each production method influences inventory differently. Level strategies require buffer inventories; chase strategies minimize them; hybrid strategies require careful inventory planning. You must understand safety stock, cycle stock, seasonal build, and service-level implications. Inventory decisions also influence working capital, warehouse capacity, and customer service. CPIM requires understanding how to select the correct inventory strategy that aligns with production planning decisions and demand patterns.

11. Role of Forecasting in Production Planning
Accurate forecasting is essential in designing effective production plans. Aggregate forecasts guide production

planning at the family level, while detailed forecasts support MPS. Understanding forecast accuracy metrics, bias, smoothing techniques, and segmentation helps improve planning reliability. CPIM highlights how poor forecasts lead to production instability, excess inventory, and capacity imbalance. Forecasts directly influence the choice of production strategy and workforce/resource planning.

12. Production Plan vs. Master Production Schedule (MPS)
The production plan operates at product-family level and longer time horizons, while MPS works at individual product/SKU level and shorter horizons. The production plan provides boundaries for MPS volume decisions. CPIM emphasizes the linkage between the two and how inconsistencies cause nervousness, inefficiencies, and customer service issues. Understanding how production plans translate into MPS is a core planning concept.

13. Rough-Cut Capacity Planning (RCCP)
RCCP tests the feasibility of the production plan or MPS using aggregated capacity data. Tools include bill of resources, capacity planning using overall factors, and resource profiles. RCCP helps identify bottlenecks early and ensures the production plan is load-feasible before moving to detailed planning. CPIM emphasizes which RCCP method to use and how RCCP differs from detailed capacity planning.

14. Make-to-Stock (MTS) Production Method
MTS builds finished goods before customer orders arrive, based on forecasts. It relies heavily on accurate forecasting,

inventory buffers, and stable production processes. MTS is common in high-volume, low-variety environments. CPIM tests MTS advantages—short lead times and economies of scale—and disadvantages—risk of obsolescence and forecast dependency. Understanding MTS helps determine appropriate production strategies based on demand characteristics.

15. Make-to-Order (MTO) Production Method

MTO begins production after receiving a customer order. It reduces finished goods inventory but increases lead time. Used for customized products or unpredictable demand, MTO requires flexible capacity, reliable suppliers, and strong order management. CPIM emphasizes when MTO is appropriate and how it affects production planning, scheduling, and customer service. MTO often operates with minimal forecasting and depends more on customer commitments.

16. Assemble-to-Order (ATO) Production Method

ATO keeps subassemblies or components in stock but assembles final products after order receipt. It balances flexibility and responsiveness. ATO requires modular design, good postponement strategies, and effective component inventory control. CPIM highlights how ATO affects BOM structure, lead times, finished goods inventory, and service performance. Understanding decoupling points and inventory positioning is essential for ATO.

17. Engineer-to-Order (ETO) Production Method

ETO begins product design and engineering only after receiving a customer order. Common in complex, customized, or capital-intensive products, ETO has long lead times, uncertain routings, and unique BOMs. CPIM tests ETO characteristics, planning challenges, and how ETO differs from MTO and ATO. Production planning focuses on project management, long planning horizons, and close customer interaction.

18. Product Family Grouping for Aggregate Planning

Grouping products into families simplifies planning by reducing data complexity. Products are grouped based on similar resource usage, market segment, or production process. Families allow planners to work with aggregate demand and capacity data, making the production plan more stable and manageable. CPIM emphasizes how improper grouping disrupts capacity planning, scheduling, and MPS.

19. Planning Time Fences and Stability

Time fences define how flexible the production plan and schedule are during different planning horizons. Near-term periods allow little or no change, while mid-term and long-term horizons have increasing flexibility. This structure prevents nervousness in production. CPIM tests your ability to apply time fences to different production environments and explain how they support planning stability.

20. Linking Production Planning to S&OP and MRP

Production planning is the bridge between S&OP and detailed execution via MRP. It translates business-level decisions into operational instructions, ensuring alignment across demand, inventory, and capacity. CPIM emphasizes how consistent linkages ensure feasibility, reduce conflict, and stabilize operations. Understanding these linkages ensures clarity on how high-level decisions drive day-to-day production and procurement activity.

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