



# Certified Supply Chain Professional

Production Activity Control





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# Production Activity Control

## 1. Definition and Role of Production Activity Control

Production Activity Control (PAC) ensures that production operations are executed efficiently, according to the planned schedule. It translates master and material plans into actionable shop-floor instructions, monitors work progress, and adjusts activities to meet delivery, cost, and quality targets. PAC bridges planning and execution, ensuring smooth workflow and resource utilization.

## 2. Objectives of PAC

The main objectives of PAC are to implement production plans, control work-in-process (WIP), minimize lead times, optimize resource use, and maintain delivery reliability. It provides feedback for adjusting capacity, schedules, and inventory, ensuring that operations meet business goals and customer commitments.

## 3. Relationship with MPS and MRP

PAC operates within the framework set by the **Master Production Schedule (MPS)** and **Material Requirements Planning (MRP)**. While MPS defines what and when to produce, and MRP ensures material availability, PAC executes the plan at the shop-floor level. Together, they form a closed-loop control system connecting planning and execution.

## 4. Order Release Process

PAC controls the release of work orders to production. Releasing too early increases WIP and inventory costs, while delaying orders risks late delivery. Effective release

management involves checking material availability, capacity, tooling, and setup readiness to maintain optimal workflow and efficiency.

## 5. Dispatching

Dispatching is the process of authorizing and starting work at specific work centers. It includes assigning operators, machines, tools, and materials. Dispatch lists or priority rules (like FIFO, LIFO, or shortest processing time) guide operations to meet due dates and minimize idle time or bottlenecks.

## 6. Priority Control

Priority control ensures that jobs are executed in the correct sequence to meet delivery commitments and minimize delays. Tools like **Gantt charts**, **Kanban boards**, and **dispatch lists** help visualize job order priorities. Effective priority control balances customer service levels with efficient resource usage.

## 7. Work-in-Process (WIP) Management

Managing WIP is crucial for maintaining flow and preventing congestion on the shop floor. Excess WIP ties up capital and increases lead time, while too little WIP can cause idle machines. PAC monitors WIP levels to maintain flow equilibrium and operational efficiency.

## 8. Lead Time Management

Lead time includes queue, setup, run, move, and wait times. PAC helps reduce total lead time through efficient scheduling, load balancing, and process improvements. Shorter lead times improve responsiveness, lower inventory, and enhance customer satisfaction.

## 9. Capacity Loading

Capacity loading ensures that work centers are neither over- nor under-loaded. **Infinite loading** assigns work without regard to capacity constraints, while **finite loading** respects resource limits. PAC uses load charts to compare planned loads versus available capacity and adjust schedules accordingly.

## 10. Scheduling Techniques

Scheduling in PAC can be **forward** (starting from a release date) or **backward** (working backward from a due date). Techniques like **Gantt charts**, **critical ratio**, and **Johnson's rule** help allocate jobs efficiently, minimize idle time, and ensure on-time completion.

## 11. Shop Floor Control Systems

Shop floor control systems track order progress, monitor machine status, and report completion data in real time. They enable managers to identify delays, reallocate resources, and maintain transparency. Modern systems integrate with ERP/MES platforms for real-time visibility and control.

## 12. Feedback and Performance Reporting

PAC provides essential feedback on production status, output, and delays. This information supports continuous improvement and informs future planning cycles. Metrics like on-time completion rate, throughput, and machine utilization help measure PAC effectiveness and drive corrective actions.

### **13. Flow Control and Work Sequencing**

PAC manages the flow of materials and jobs through work centers to prevent bottlenecks. Sequencing determines the order of operations to optimize efficiency. Common sequencing rules include **earliest due date (EDD)**, **shortest processing time (SPT)**, and **critical ratio (CR)**.

### **14. Bottleneck and Constraint Management**

PAC identifies bottlenecks that restrict overall throughput and implements corrective measures, such as schedule adjustments, load redistribution, or additional capacity. Integrating **Theory of Constraints (TOC)** principles helps optimize system-wide performance rather than just local efficiency.

### **15. Just-in-Time (JIT) and Lean Integration**

PAC plays a crucial role in implementing **Lean** and **JIT** systems by controlling work release, reducing waste, and ensuring synchronized flow. Pull systems like **Kanban** help minimize inventory, improve flow, and respond quickly to changes in customer demand.

### **16. Kanban and Pull Systems**

Kanban systems control production activity based on actual consumption rather than forecasts. PAC uses visual signals (cards, bins, or electronic tags) to trigger replenishment or movement of materials, ensuring a steady flow and minimal overproduction.

## 17. Performance Metrics in PAC

Key PAC metrics include **schedule adherence**, **throughput**, **WIP levels**, **machine utilization**, **queue times**, and **on-time delivery rate**. Monitoring these KPIs helps managers identify inefficiencies, optimize resource use, and improve overall production effectiveness.

## 18. Rework and Scrap Management

PAC tracks rework and scrap to identify quality issues and minimize waste. Understanding where and why defects occur supports root cause analysis and continuous improvement. Reducing rework increases throughput and improves cost efficiency.

## 19. Coordination with Maintenance and Quality Control

PAC must coordinate with maintenance and quality departments to avoid production disruptions. Preventive maintenance schedules and quality checks are integrated into production plans to ensure equipment reliability and consistent output quality.

## 20. Digital and Smart PAC Systems

Modern PAC systems leverage **IoT sensors**, **MES (Manufacturing Execution Systems)**, and **AI-driven analytics** for real-time control, predictive scheduling, and performance optimization. These technologies enhance visibility, accuracy, and responsiveness, enabling data-driven shop-floor decisions.

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# Micro-Learning Programs in Supply Chain Management



1. Fundamentals of Supply Chain Management
2. Supply Chain Planning and Optimization
3. Demand Forecasting Techniques
4. Inventory Control and Management
5. Distribution and Logistics Strategy
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

# 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)
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
20. Category Strategy Development
21. Managing Global and Offshore Procurement
22. Negotiation Simulation Workshop
23. Contract Law for Procurement Managers
24. Cost Reduction Strategies in Procurement
25. Supplier Risk Assessment Models

# 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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