



# Certified in Planning and Inventory Management

Measuring Quality Costs





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# Measuring Quality Costs

## 1. Cost of Quality (COQ) Framework

The Cost of Quality framework measures the total cost of ensuring good quality plus the cost of failing to achieve it. It includes prevention, appraisal, internal failure, and external failure costs. CPIM professionals must understand COQ because it helps quantify the financial impact of poor processes, supports decision-making for improvement initiatives, and drives investments in prevention. Tracking COQ highlights inefficiencies and enables continuous improvement.

## 2. Prevention Costs

Prevention costs are investments made to stop defects before they occur. Examples include training, process design, quality planning, supplier development, and preventive maintenance. CPIM candidates must understand how these costs support operational stability and reduce long-term failure expenses. Prevention actions usually yield the highest return by reducing scrap, rework, warranty claims, and customer dissatisfaction. Effective prevention improves reliability and reduces overall COQ.

## 3. Appraisal Costs

Appraisal costs relate to evaluating products and processes to ensure quality compliance. They include inspections, testing, audits, vendor assessments, and calibration of measuring equipment. These activities detect defects early and prevent nonconforming products from reaching customers. CPIM professionals should understand how appraisal costs balance prevention and failure costs and

how excessive inspection may indicate poor process capability.

#### **4. Internal Failure Costs**

Internal failure costs arise when defects are found before a product reaches the customer. They include scrap, rework, re-inspection, re-testing, and downtime caused by quality issues. These failures disrupt production, increase lead times, and raise inventory levels. CPIM learners must know how to track and analyze internal failure costs to identify process weaknesses and prioritize improvement initiatives.

#### **5. External Failure Costs**

External failure costs occur when defective products reach customers. These include warranty claims, service calls, returns, replacements, product recalls, and lost customer goodwill. External failures are the most expensive because they impact brand reputation and future sales. CPIM candidates must understand how to calculate and reduce these costs through preventive actions and root cause analysis.

#### **6. Cost–Benefit Analysis for Quality Initiatives**

Cost–benefit analysis helps determine whether proposed quality improvements are financially viable. It compares prevention and appraisal investments with potential savings from reduced failure costs. CPIM professionals must understand how to quantify savings, justify projects, and prioritize initiatives that provide the highest ROI. This ensures resources are aligned with strategic quality goals.

## **7. Activity-Based Costing (ABC) for Quality**

ABC assigns costs to activities based on resource consumption. Applying ABC to quality helps identify true cost drivers and reveals hidden quality-related expenses. For CPIM candidates, understanding ABC supports accurate cost measurement, helps identify high-cost processes, and improves decision-making regarding process changes or supplier selection.

## **8. Quality Cost Reporting and Dashboards**

Quality cost reporting provides visibility into trends, performance, and improvement opportunities. Dashboards may include metrics such as COQ percentage of sales, failure cost trends, scrap rates, or defect density. CPIM professionals must understand how to design, interpret, and use reports to make informed decisions and monitor the effectiveness of quality initiatives.

## **9. Linking COQ to Continuous Improvement**

COQ supports continuous improvement by identifying costly failure modes and highlighting areas with the highest return on investment. CPIM candidates should understand how COQ integrates with Lean, Six Sigma, Kaizen, and other improvement programs. Using COQ data ensures improvement efforts are targeted and financially justified.

## **10. Impact of Poor Quality on Supply Chain Performance**

Poor quality affects lead times, capacity, inventory levels, transportation costs, supplier reliability, and customer satisfaction. CPIM professionals must recognize how quality costs cascade throughout the supply chain. Understanding

these impacts helps planners better evaluate sourcing decisions, production scheduling, and risk management strategies.

### **11. Supplier-Related Quality Costs**

Suppliers contribute significantly to quality costs through incoming defects, delays, or noncompliance. CPIM candidates must understand supplier cost measurement, including incoming inspection costs, supplier-caused scrap, returns, premium freight, and evaluation audits. Effective supplier quality management reduces failure costs and improves supply chain stability.

### **12. Cost of Poor Quality (COPQ)**

COPQ is the portion of COQ associated with internal and external failures. It represents the financial impact of defective products, wasted labor, lost materials, warranty claims, and customer complaints. CPIM learners must understand COPQ because reducing it offers strong opportunities for savings and improved profitability.

### **13. Measuring Scrap and Rework Costs**

Scrap and rework represent major internal failure costs. Measuring these involves tracking lost materials, added labor, machine time, and overhead. CPIM professionals must understand how to calculate these costs, identify root causes, and use process improvement to reduce them. High scrap often indicates capability issues or supplier problems.

### **14. Warranty and Service Cost Analysis**

Warranty costs include labor, replacement parts, returns, shipping, and handling. CPIM candidates must understand

how warranty claims reflect product quality issues and how analyzing them helps detect systemic failures. Warranty trends help improve forecasts, quality planning, and customer communication.

### **15. Cost Impacts of Nonconformance**

Nonconformance costs arise from deviations from specifications—whether caused by design, manufacturing, handling, or documentation errors. These costs include investigation, sorting, material review board activities, and disposition. Understanding nonconformance costs helps CPIM learners prioritize corrective actions and improve process reliability.

### **16. Performance Metrics for Quality Costs**

Metrics may include COQ as a percentage of sales, defect rates, ppm (parts per million), first-pass yield, scrap percentage, and cost-of-failure trends. CPIM candidates must understand how these KPIs support strategy and decision-making. Effective measurement ensures organizations can track improvements and justify investments.

### **17. Root Cause Analysis as a Cost Reduction Tool**

Root cause analysis (RCA) reduces quality costs by eliminating systemic issues. CPIM professionals must understand tools such as 5 Whys, fishbone diagrams, Pareto analysis, and FMEA. RCA eliminates wasteful spending on rework, scrap, and external failures by addressing the true source of problems.

## **18. Cost Implications of Process Capability (Cp/Cpk)**

Poor process capability leads to higher failure costs and increased inspection. CPIM candidates should understand how capability indices reflect process stability and predictability. Improving capability reduces variation, improves throughput, and lowers defect-related expenses.

## **19. Benchmarking Quality Costs**

Benchmarking compares an organization's COQ against industry standards or best-in-class performance. CPIM learners must understand how benchmarking identifies gaps, drives improvement targets, and validates progress. Benchmarking also builds competitive advantage by revealing opportunities for cost reduction.

## **20. Linking COQ to Strategic Planning**

Quality costs influence long-term strategy, investment decisions, capacity planning, and customer satisfaction goals. CPIM candidates must understand how COQ supports strategic planning by highlighting financial risks, performance gaps, and opportunities for competitive differentiation. Integrating COQ into strategy ensures quality becomes a value-creating function.

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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
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

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4. Contract Management Essentials
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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
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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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