Quality Costs

Costs associated with “poor” quality

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Costs of Making, finding, repairing and avoiding Defects

Cost of a Defect at Different Stages of a “Process”

At vendor in production at retail outlet/distributor at custom

Metrics for Quality Cost Analyses

Qualitative Metrics
Quantitative Metrics

Measurement Bases for Quality Costs

Direct labor hour
Direct labor dollars
Standard manufacturing cost dollars
Value added dollars
Sales dollars
Product units

Advantages of Measurement Bases

Direct labor hour - readily available and understood
Direct labor dollars - available and understood.
Tends to balance inflation effects
Standard manufacturing cost dollars - more stable than measures tied to direct labor
Value added dollars - useful when processing costs are important
Sales dollars - appeals to higher management
Product units - simplicity
Measurement Bases for Quality Costs

Disadvantages of Measurement Bases

- Direct labor hour - can be drastically influenced by automation
- Direct labor dollars - can be drastically influenced by automation
- Standard manufacturing cost dollars - includes overhead costs both fixed and variable
- Value added dollars - problem comparing different types of operations
- Sales dollars - can be influenced by changes in prices, marketing costs, demand, etc.
- Product units - not appropriate when different products are made unless "equivalent" items can be defined

Metrics for Quality Cost Analyses

Hidden Costs of Poor Quality

Categories of Quality Costs

Costs “of non-conformance”

- Internal Costs
  - Evaluation, dispose, correct or replace product, service prior to delivery to the customer
- External Costs
  - Costs incurred when a nonconforming product gets to the customer

Costs “of conformance”

- Prevention costs
  - Costs of preventing defects before they occur
- Appraisal
  - Costs to detect problems before the delivery to the customer

Model for Optimum Costs
"Old" Model for Optimum Costs

Quality Cost Categories

Internal Error
- Scrap and rework
- Troubleshooting and repair
- Retest
- Failure analysis
- Added inventory costs
- Downgrading

Quality Cost Categories

Internal Error (cont.)
- Re-inspecting rejected supplier lots
- Corrective actions
  - process changes
  - engineering changes - retraining
  - rewriting documents
- Screening bad from good items
- Productivity loss

Quality Cost Categories

External Error
- Product liability suits
- Complaint handling
- Field troubleshoot, repair, and retest
- Field repairman training
- Return parts handling and repairs
- Failure analysis

Quality Cost Categories

External Error (cont.)
- Engineering changes to repair field problems
- Field corrective action
- Repair manuals
- Marketing errors

Quality Cost Categories

Appraisal
- Quality Audits
- Inspection and testing
- Inspection of purchased items
- Set-ups for inspections and tests
- Outside endorsements
- Maintenance of inspection and test equipment
- Quality analysis
- Field performance testing
Quality Cost Categories

Appraisal (cont.)
- In-process control charts
- Packaging evaluations
- Assurance testing before first shipment
- Field data systems
- Measurement and QA data processing
- Quality data collection and analysis operations
- Installation testing

Quality Cost Categories

Prevention
- Quality planning
- Training of manufacturing operators
- Training of quality inspectors
- Process control planning
- Quality data collection and analysis system planning
- Quality reporting equipment costs preventive action

Quality Cost Categories

Prevention (cont.)
- Procedure preparation
- Quality motivation programs
- Test equipment planning
- Product engineering pre-customer ship evaluation
- Vendor qualification
- Training for equipment maintenance

Reasons Why Quality Cost Systems Fail

Reasons and Solutions
The system is instituted for all products and departments at one time. Try it out for one product to obtain a successful case history. The Accounting Department is ignored because of their lack of cooperation. Work with Accounting to the degree they are willing to participate. This will help expand their role later. QC insists that certain controversial costs be included. Agree to exclude or separately identify any such costs. The reports fail to talk the different languages needed at various management levels. Use different units as required for various levels and try out a sample report before "finalizing" the system.

Reasons Why Quality Cost Systems Fail

Reasons and Solutions (cont.)
No provision is made for investing additional funds in prevention activities. Tell management the amount and type of resources needed to achieve a defined saving. The role of top management in cost reduction is unclear. Propose numerical goals and identify specific projects. Ask management to provide necessary resources and assign responsibility to line departments. No provision is made to obtain the facts needed to diagnose causes of problems. Propose some organizational mechanism that will be responsible for diagnosis of causes.

Reasons Why Quality Cost Systems Fail

Reasons and Solutions (cont.)
The cost data is presented in categories that are too broad to be useful. Provide detail to the level needed. A corporate QC office issues one quality cost procedure for all plants without giving each plant the opportunity to review it before issuance. Allow sufficient time for plants to comment. Allow enough flexibility to care for plant differences. The real objective is cost reduction and not consistency in reports as an end in itself. QC regards the system as "theirs" to maintain. When possible, turn over all the data collection and issuance of reports to Accounting. QC should concentrate on the analysis and interpretation of the data.
**Traditional Phases of a Quality Cost Program**

<table>
<thead>
<tr>
<th>Planning Phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Implementation Phase</td>
</tr>
<tr>
<td>Project Phase</td>
</tr>
<tr>
<td>Control Phase</td>
</tr>
</tbody>
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