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Agenda
Executive Summary
Company Selection for Benchmark
Quality Assurance Framework
Benchmark Company Observations
Industry Quality Assurance Cost Estimates
Industry Selection of Quality Assurance Methods
Industry Quality Assurance Cost Estimates
Measuring the Cost of Quality
The cost of quality assurance is very difficult to measure. However, we can better understand it by looking at several different points of view.
Benchmark company observations and anecdotes

Cost drivers of each quality assurance method

Cost of supplier quality concept

Total Cost of Ownership concept
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Industry Quality Assurance Cost Estimates
How does industry account for the cost of quality assurance? Not measured on a per unit or per acquisition dollar basis. Seek to minimize the cost of supplier quality, not the cost of quality assurance. Cost of supplier quality = cost of failure + cost of quality assurance.

Which budget is the cost of quality assurance allocated to? Cost may be contained within a commodity group. Cost may be allocated across all finished goods or services. Measuring the cost of supplier quality: Companies will not share the cost information if supplier quality provides a strategic advantage over competitors. In some cases, the cost of supplier quality is not tracked in a measurable format.
The benchmark companies do not track the cost of each quality assurance method applied, nor do they attempt to quantify the dollar benefit of quality assurance.
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Industry Quality Assurance Cost Estimates
Texas Instruments estimates fabrication down time to be $40,000 per hour. Toyota Motor Company charges its suppliers $10,000 per minute of manufacturing downtime associated to poor quality material. However, Toyota has never had to enforce this rule in North America! Toyota does not commence full production at new facilities until it has developed all new suppliers to deliver zero defects on a just-in-time basis. Toyota estimates the cost of supplier selection to be $250,000. Intel Corporation dedicates 6.4 full-time equivalents to silicon quality assurance, out of the total 23 full-time equivalents in the Silicon Material and Technology Group. In 1988, J. M. Juran estimates the implementation cost of supplier certification to be $500,000. This estimate includes commodity selection, personnel training, development of measurement system and streamlining quality evaluation systems.
Although industry does not measure the cost of quality assurance, the benchmark companies provided several anecdotal costs of supplier failure:
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Industry Quality Assurance Cost Estimates
Cost of Quality Assurance Methods
Partnership Overhead
Travel
Others
# Capital Investments
Before a quality assurance method can be implemented, the required skills and resources must be developed or acquired. The required skills and resources identified during the benchmark study are categorized into six cost drivers.
Specific cost drivers of each method identified for both implementation and ongoing application. Cost drivers = resource requirements with the greatest impact. Cost drivers were identified by synthesizing industry observations of quality assurance method resource requirements and process steps. Identifying relevant cost drivers allows better management of hidden costs.
Industry Quality Assurance Cost Estimates
Cost of Supplier Quality = Cost of Failure + Cost of Quality Assurance
Results of External Failures
Liability claims
Lost customer satisfaction and revenue
Recall
Warranty claims
Results of Internal Failures
Scrap, rework
100% inspection of poor quality products
Manufacturing down time
Material Review Board process
Examples of Identification Methods
Inspection of kind, count and condition
Inspection of certificates of conformance
Source inspection
Sample inspection of good quality products
Examples of Prevention Methods
Metrology development
Materials qualification
Supplier selection, qualification and certification
Supplier feedback and recognition
Supplier development
Cost of Quality Assurance = Cost of Identification + Prevention Methods
Cost of Failure = Cost of Internal + External Failures
The cost of supplier quality is the sum of the cost of failure and the cost of quality assurance.
Industry Quality Assurance Cost Estimates
Cost of Supplier Quality Curve
Zone of Improvement Projects
Optimum Balance Cost of Failure Cost of Quality Assurance
Zone of High Identification Costs
Zero Nonconformance
Minimal ROI due to excessive nonconformance
Minimal ROI due to over-inspection
The cost of supplier quality curve is a theoretical tool that demonstrates how quality assurance resources can be allocated in order to increase the return on investment.
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Mathematically difficult to calculate, without the use of simulation or linear programming. Theoretical tools that helps illustrate trade-offs happening as a result of all methods Industry is using.
Optimum Balance
Cost of Failure
Cost of Quality Assurance
Industry Quality Assurance Cost Estimates
Prevention
To maximize the return on investment and minimize the cost of supplier quality, two trade-offs must be balanced. First, the cost of failure must be weighed against the cost of quality assurance. Second, the cost of preventive methods must be weighed against the cost of identification methods.
Easiest to identify cost and relate to unit of purchase
Degree of Difficulty
More difficult to identify and relate to unit of purchase.
Industry Quality Assurance Cost Estimates
Transportation
Planning/#Purchasing/#Internal Quality
Warehousing, handling, administrative, obsolescence, carrying costs
Inventory Costs
Defective Materials
Factory Yield
Field Failures
Services
General Administration
Total Cost of Ownership (TCO) is a concept used to understand costs associated with a purchase, above and beyond price. Such costs may include supplier selection, qualification, certification, order placement, inspection, payment and quality related issues.
Mention how cost of supplier quality is part of Total Cost of Ownership
Source: Center for Advanced Purchasing Studies, *Total Cost Modeling in Purchasing,* 1994
Benefits Reported by Implementing Companies
Provides a consistent supplier evaluation tool
Clarifies and defines supplier performance expectations
Prioritizes continuous improvement efforts
Improves understanding of supplier performance issues and cost structure
Provides excellent data for negotiations
Potential to justify higher initial costs based on better quality
Provides a long-term purchasing focus
The Center for Advanced Purchasing Studies has summarized the benefits of a Total Cost of Ownership approach for sourcing decisions.
General Characteristics of Buys Appropriate for TCO Analysis
Source: Center for Advanced Purchasing Studies, Total Cost Modeling in Purchasing, 1994
Industry Quality Assurance Cost Estimates
Bottleneck items, repetitive, high-risk
High-level decision, cost take-out opportunity: on processes
Repetitive, long-term buys
Firm X
Up to team; big-dollar items, cost-benefit consideration
All production inputs up to teams if they actually want to use
Major issues with a process focus, may consider many costs simultaneously.
###Motorola SPS
Major purchases are all sector-level decisions; beyond that, it is at the discretion of the commodity team.
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$100,000 and above, ongoing
Commodity purchases, significant expenditures
Routine, repetitive purchases with a history
Major productive capital expenditures; can also vary other input costs/yield like raw materials, supplies — see impact of differential performance over equipment life
Companies implement TCO selectively because the model is time consuming to develop and must be tailored to the buy. Applied correctly, TCO is viewed as an important tool for long-run competitiveness.
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