

# Cost of Quality

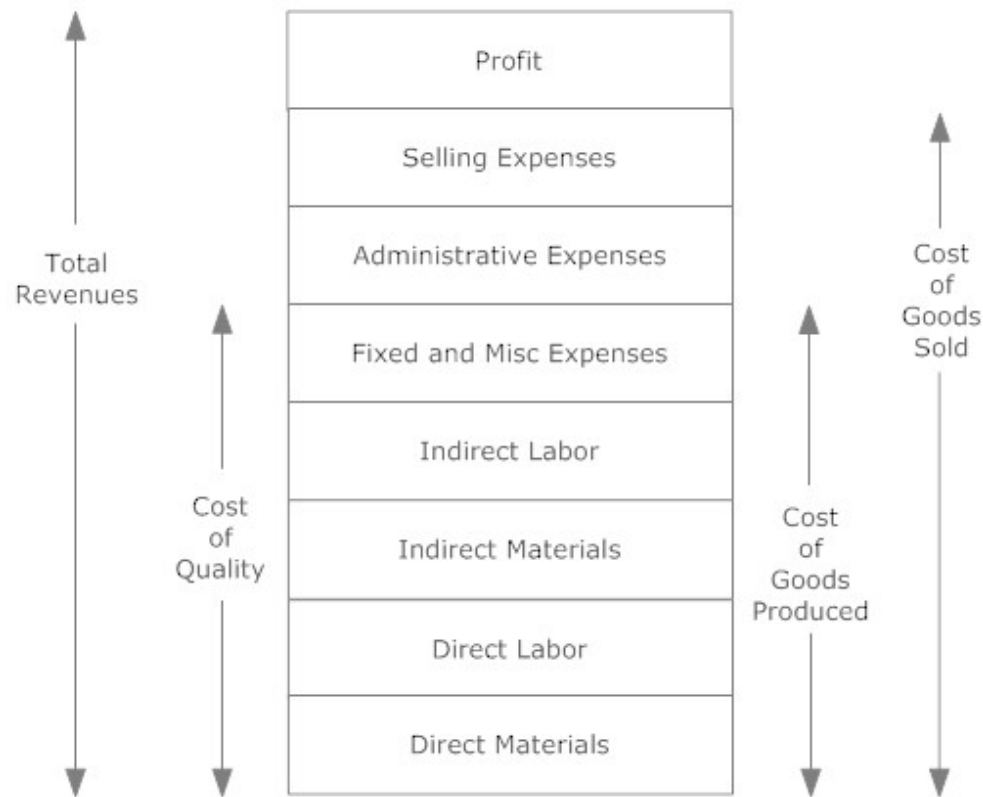
## Quality Cost Systems

# Understanding Quality Cost

- Controllable Costs
  - Prevention
  - Appraisal
  - No-value added
- Resultant Costs
  - Internal Failure
  - External Failure
- Equipment Costs

# Quality Cost Areas

## Traditional Financial Structure Showing Quality Cost Areas



# Cost Category Relationships

Typical Ratios for American Companies:

Cost Category	Percent of total
Internal Failure	20-40
External Failure	20-40
Appraisal	10-50
Prevention	0-5

# Prevention Costs - Example

Income Statement	
Income	
Sales	\$4,100,000
Returns	(\$105,000)
Income	<u>\$3,995,000</u>
Cost of Goods Sold	
Labor	\$960,600
Materials	\$1,118,000
COGS	<u>\$2,078,600</u>
Expenses	
Salaries	\$483,800
Services	\$98,400
Depreciation	\$194,340
Training	\$3,300
Supplies	\$36,900
Interest	\$61,500
Rent	\$287,000
Accounting	\$24,600
Legal	\$28,200
Office Supplies	\$16,400
Travel	\$28,700
Licenses/Certification	\$12,300
Meals and Ent.	\$15,300
Advertising	\$82,000
Sales Shows	\$41,000
Repairs	\$44,600
Telephone	\$20,500
Utilities	\$36,900
Expenses	<u>\$1,515,740</u>
Profit	<u>\$400,660</u>

## Hidden Quality Costs

### Prevention Costs

**\$20,000**

- Quality Planning \$4,000
  - Engineering design \$10,000
  - Quality Training \$2,000
  - Preventive maint. \$4,000
- \$20,000**

# Appraisal Costs - Example

Income Statement	
Income	
Sales	\$4,100,000
Returns	(\$105,000)
Income	\$3,995,000
Cost of Goods Sold	
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Materials	\$1,118,000
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Utilities	\$36,900
Expenses	\$1,515,740
Profit	\$400,660

## Hidden Quality Costs

### Appraisal Costs

**\$250,000**

- Inspector wages \$40,000
  - In-process inspect \$75,000
  - Quality audits \$20,000
  - Calibration services \$40,000
  - Supplies \$15,000
  - QC floorspace \$50,000
  - Regulatory approval \$10,000
- \$250,000**

# Internal Failure Costs - Example

Income Statement	
Income	
Sales	\$4,100,000
Returns	(\$105,000)
Income	<u>\$3,995,000</u>
Cost of Goods Sold	
Labor	\$960,600
Materials	\$1,118,000
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## Hidden Quality Costs

### Internal Failure Costs

**\$400,000**

- Labor (rework) \$110,000
  - Materials (rework) \$95,000
  - Eng. redesign \$30,000
  - Failure analysis \$20,000
  - Software fix \$40,000
  - Fire loss – equip. \$70,000
  - Rework space \$35,000
- \$400,000**

# External Failure Costs - Example

Income Statement			
Income			
Sales		\$4,100,000	
Returns		(\$105,000)	
Income		\$3,995,000	
Cost of Goods Sold			
Labor		\$960,600	
Materials		\$1,118,000	
COGS		\$2,078,600	
Expenses			
Salaries		\$483,800	
Services		\$98,400	
Depreciation		\$194,340	
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Licenses/Certification		\$12,300	
Meals and Ent.		\$15,300	
Advertising		\$82,000	
Sales Shows		\$41,000	
Repairs		\$44,600	
Telephone		\$20,500	
Utilities		\$36,900	
Expenses		\$1,515,740	
Profit		\$400,660	

<b>Hidden Quality Costs</b>	
<b>External Failure Costs</b>	
	<b>\$330,000</b>
• Returns	\$105,000
• Labor	\$60,000
• Materials	\$40,000
• Consulting Services	\$37,000
• Legal	\$25,000
• Travel	\$15,400
• Meals & Entertain	\$3,000
• Repairs	<u>\$44,600</u>
	<b>\$330,000</b>

# COPQ - Example

Income Statement	
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Income	<u>\$3,995,000</u>
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Materials	\$1,118,000
COGS	<u>\$2,078,600</u>
Expenses	
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Profit	<u>\$400,660</u>

Prevention: \$20,000  
 Appraisal: \$250,000  
 COC \$270,000

Int. Failure: \$400,000  
 Ext. Failure: \$330,000  
 COPQ \$730,000

$$\text{COPQ/Sales} = 18.3\%$$

# TCOQ - Example

Income Statement	
Income	
Sales	\$4,100,000
Returns	(\$100,000)
Income	<u>\$3,998,000</u>
Cost of Goods Sold	
Labor	\$960,600
Materials	\$1,118,000
COGS	<u>\$2,078,600</u>
Expenses	
Salaries	\$483,800
Services	\$98,400
Depreciation	\$194,340
Training	\$3,300
Supplies	\$36,900
Interest	\$61,500
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Accounting	\$24,600
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Telephone	\$20,500
Utilities	\$36,900
Expenses	<u>\$1,515,740</u>
Profit	<u>\$400,660</u>

Prevention: \$20,000  
 Appraisal: \$250,000  
 COC \$270,000

Int. Failure: \$400,000  
 Ext. Failure: \$330,000  
 COPQ \$730,000

**TCOQ \$1,000,000**  
**(TCOQ/Sales = 24.4%)**

# QCS - Starting Out

- Forming an implementation team
- Developing an implementation plan
- Selecting a trial area
- Starting the program
- Identifying and classifying the cost elements
- Establishing inputs to the system
- Established outputs to the system

# QCS - Starting Out (cont')

- Defining additional data-assistance needed
- Reviewing status
- Starting the trial period
- Reviewing the monthly report
- Modifying with experience
- Expanding the program

# Advantages

- Provides a manageable entity and a single overview of quality
- Aligns quality and company goals
- Provides a problem prioritization system and means of measuring change
- Provides a way to distribute costs for maximum profit
- Improves the effective use of resources
- Provides emphasis for doing the job right every time
- Helps to establish new product processes

# Limitations

- Quality cost measurement does not solve quality problems
- Quality cost reports do not suggest specific actions
- Quality costs are subject to short-term management
- Difficulty matching effort and accomplishments
- Important costs may be omitted from reporting
- Inappropriate costs may be included in reporting
- Quality costs subject to measurement errors

# Other Issues

- Perfectionism in the numbers
- Other pitfalls
  - Inclusion of non-quality costs
  - Implications of reducing costs to zero
  - Reducing quality costs while increasing total costs
  - Understatement of quality costs

# Contact Us

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