Cost of Poor Quality

BPF2123 – Quality Management System

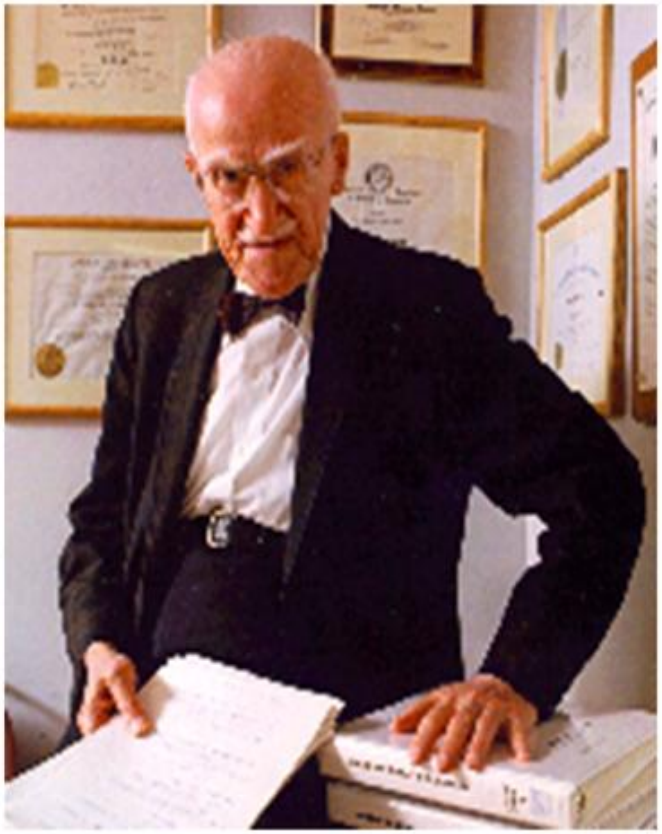
Chapter Outline

- Cost of Poor Quality
  1. Defining Quality Costs
  2. Types of Quality Costs
     - Prevention Costs
     - Appraisal Costs
     - Failure Costs
     - Intangible Costs

Lesson Outcomes

- Understanding of how quality costs can be used in decision making
- Identify the interrelationships between and among the different types of quality costs

Cost of Poor Quality (COPQ)



Managers and workers speak the language of things but Senior leaders speak the language of money...

...COPQ allows us to translate the things into money.

Cost of Poor Quality (COPQ)

What are quality costs?

The cost that would disappear if every activity was performed without defects every time.

Benefits if products / processes are defect free :

1. Faster cycle times
2. Decreased production costs
3. Lower warranty costs
4. Less wasted material
5. Reduced scrap / rework costs

Lead to:

1. Lower total cost
2. More competitive pricing
3. Higher company revenue

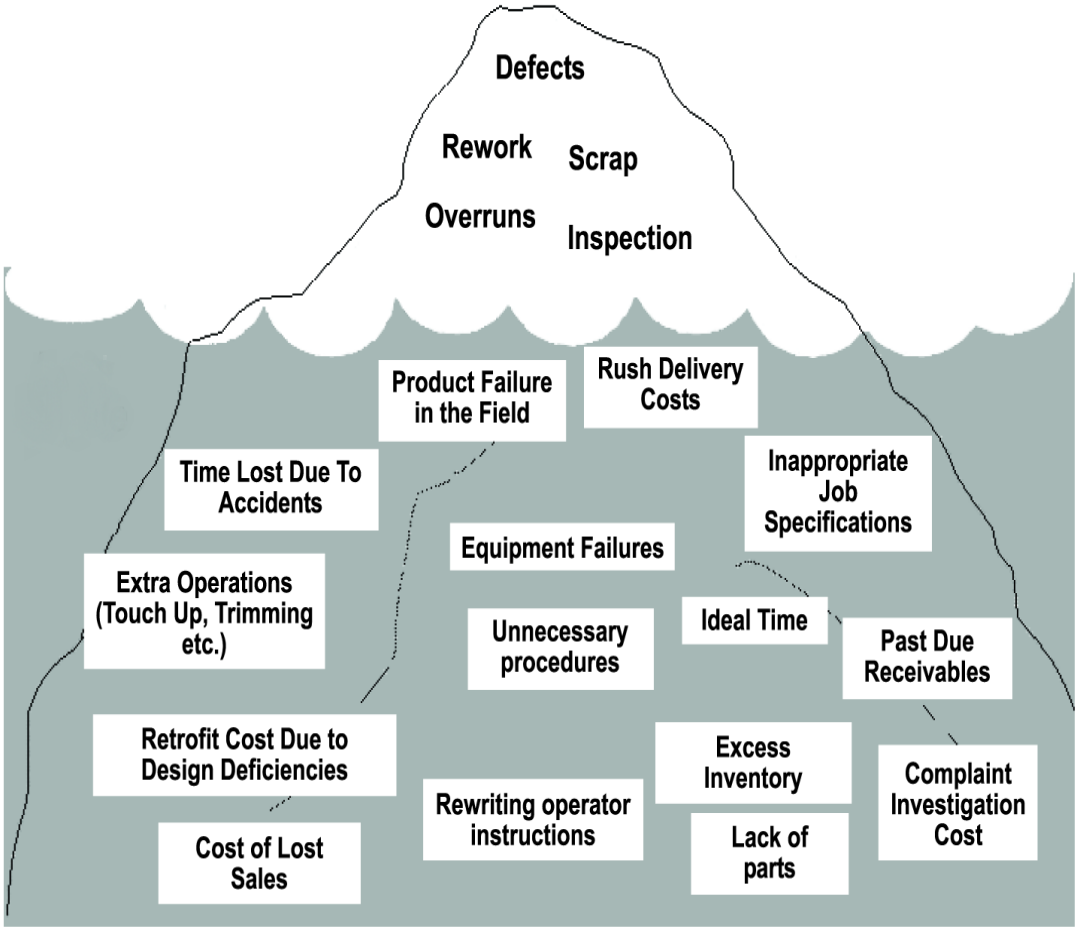
Cost of Poor Quality (COPQ)

- Juran was in year 1951 the first to discuss costs associated with poor quality and how it affects the company, while Feigenbaum five years later was the first to classify these costs into categories (Tsai, 1998).
- Sörqvist (2001) defines CoPQ as "*the total losses caused by the products and processes of a company not being perfect*".
- Harrington (1987) on the other hand defines CoPQ as *"all the cost incurred to help the employee do the job right every time and cost of determining if the output is acceptable, plus any cost incurred by the company and the customer because the output did not meet specifications and/or customer expectations"*.

Defining Quality Costs

- A quality cost is considered to be any cost that a company incurs in order to ensure that the quality of the product or service is perfect.
- Quality costs are the portion of the operating costs brought about by providing a product or service that does not conform to performance standards.
- Quality costs are also the costs associated with the prevention of poor quality.

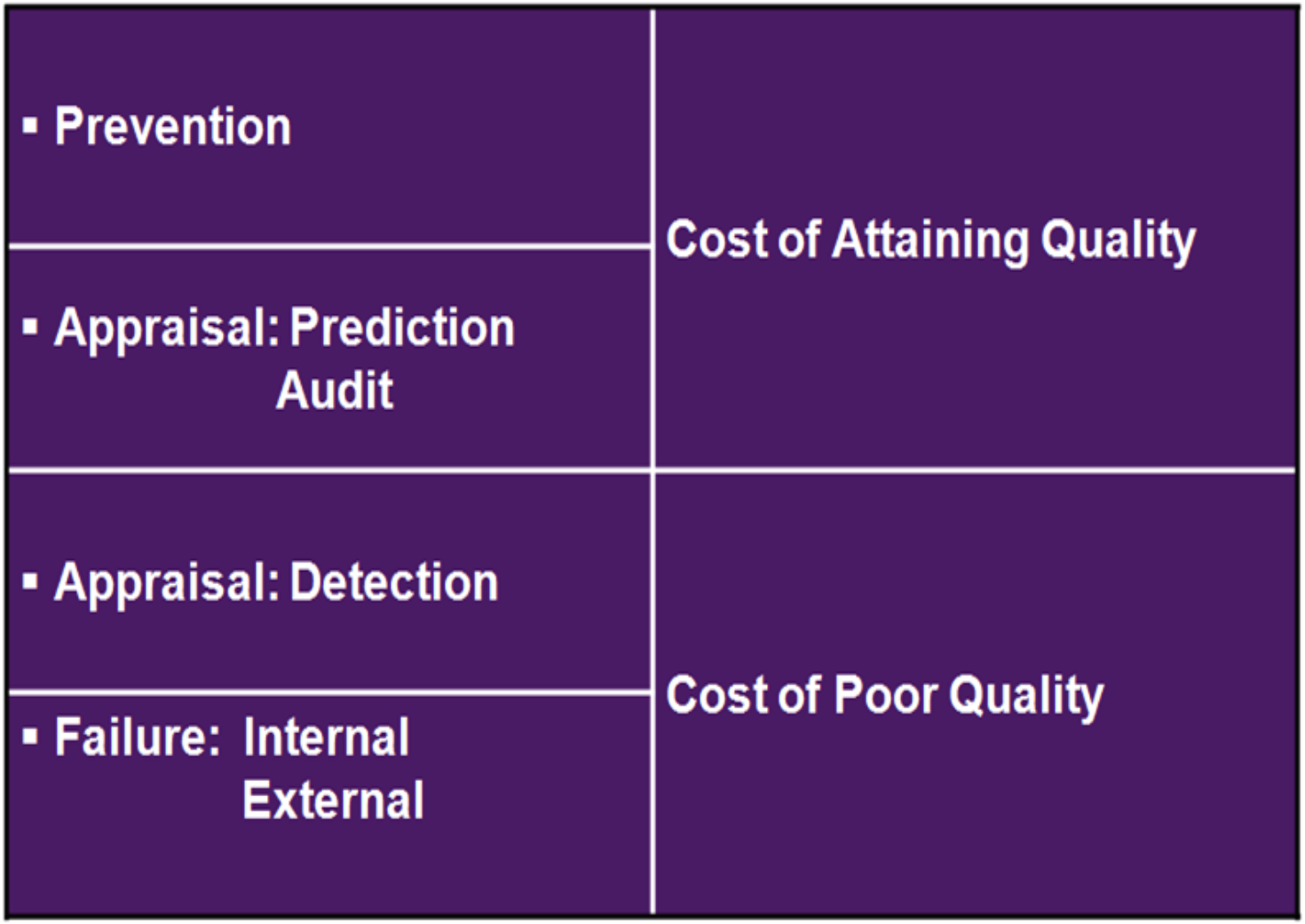
Iceberg of Quality Costs



Examples of Quality Costs

- Redesigning a faulty component that never worked right
- Reworking a shock absorber after it was completely manufactured
- Retesting a computer chip that was tested incorrectly
- Repurchasing because of nonconforming materials
- Replacing a shirt the dry cleaner lost
- Returning a meal to the kitchen because the meat was overcooked
- Retrieving lost baggage
- Responding to a customer’s complaint

Types of Quality Costs



Types of Quality Costs

PREVENTION COSTS

Those cost that occur when a company is performing activities designed to prevent poor quality in products or service.

- Examples:
  - Design reviews
  - Education and training
  - Supplier selection and capability reviews
  - Process capability reviews

- Prevention efforts try to determine the root causes of problems and eliminate them at the source so reoccurrences do not happen.

Types of Quality Costs (cont.)

APPRAISAL COSTS

The cost associated with measuring, evaluating or auditing products / services to make sure that they conform to specifications or requirements.

- Examples:
  - Incoming, WIP and final inspection or testing
  - Material reviews
  - Calibration of measuring or testing equipment

- Appraisal activities are necessary in an environment where product, process or service problems are found.

Types of Quality Costs (cont.)

FAILURE COSTS

Occur when the completed product or service does not conform to customer requirements. 2 types exist :

- **Internal**
  - Those cost associated with product nonconformities or service failures found before the product is shipped or the service is provided to the customer.
  - Examples : scrap, rework, retesting, remaking
- **External**
  - The cost that occur when a nonconforming product or service reaches the customer.
  - Examples : customer returns and complaints, warranty claims, product recalls – greatest impact on the corporate pocketbook

Types of Quality Costs (cont.)

INTANGIBLE COSTS

The hidden costs associated with providing a nonconforming product or service to a customer, involve the company's image.

- Examples:
  - Cost of missing an important deadline (schedule delays)
- Difficult to identify and quantify
- Can be three or four times as great as the tangible costs of quality
- Must not be overlooked or disregarded

COPQ for Management

Advantages

- Reducing the cost of poor quality is one of the best ways to increase a company's profit.
- Provides manageable entity and a single overview of quality.
- Aligns quality and goals.
- Prioritizes problems and provides a means to measure change/improvement.
- Provides a means to correctly distribute controllable quality cost for maximum profits.
- Promotes the effective use of resources.
- Provides incentives for doing the job right every time.

Quality Costs

Total Quality Costs =

Prevention costs + Appraisal costs + Failure costs + Intangible costs

- Once quantified, quality costs enhance decision making if they are used to determine which projects will allow for the greatest return on investment and which projects are most effective at lowering failure and appraisal quality costs.

- Quality costs information should be used to guide improvement.

Quality Costs

How to use it:

Identify all activities that exist only because of poor quality. Call together a team that includes people with firsthand knowledge of the process. Conduct a brainstorming session to capture all component tasks that exist exclusively to remedy quality problems caused by process deficiencies.

Identify where in the organization the cost of each activity is experienced. These costs may appear in one area or in multiple areas.

Determine the method you will use to calculate the cost of poor quality. To use the *total resources method*, you must identify 1) the total resources consumed in a category and 2) the percentage of those resources used for activities associated with remediating the effects of poor quality. To use the *unit cost method*, you must identify 1) the number of times deficiencies occur and 2) the average cost for correcting that deficiency.

Collect the data and estimate the costs.

Cost of Poor Quality Example

Total Resources Calculation

Activity Resulting from Poor Quality	Cost Location	Cost Location	Cost Location	Total Cost of Resources	X	Percentage of Resources to Counter Poor Quality	Total Cost for Activity
Final Inspection	Wages & Benefits	Training		$127,000		80%	$101,600
Rework	Wages & Benefits			$87,500		12%	$10,500
Customer Complaint Resolution	Wages & Benefits	Training	System Maintenance (telephone & computer)	$63,750		100%	$63,750
Total Cost of Poor Quality							$175,850